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ALLERGIC REACTIONS TO ANTITETANUS SERUM*

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DO ALLERGIC reactions to prophylactic antitetanus serum (ATS) cause more morbidity and mortality in Canada than the disease which the serum is intended to prevent? This is a question that has undoubtedly cropped up in the minds of doctors from time to time upon encountering a particularly troublesome instance of allergic reaction to ATS administration.

When I was chairman of a special committee of the London Academy of Medicine to study the desirability of mass immunization with tetanus toxoid of the employees of several large industries in London, Ontario, the committee submitted a report that was later published in this Journal.[1] In the early stage of our work, it became clear, from a consideration of the data gathered by our committee, and outlined in the report, that little or no justification for the proposed toxoid campaign could be found in an anticipated reduction in the overall morbidity and mortality from the disease, tetanus, in the city of London and its hospitals. This stands at zero already.‡ The prime reason for recommending such a campaign, with its not inconsiderable attendant expense and effort, must lie in one's concern about the amount of morbidity and mortality in our city from the disease—ATS allergy.

FREQUENCY OF REACTIONS

The first question then was: how many cases of ATS allergy occur and how severe are they? Scheibel, in her excellent article on the use of tetanus toxoid, published in the *Bulletin of the World Health Organization* in 1955,[7] had estimated about a 20-30% risk of delayed serum reactions.

TABLE I.—LONDON HOSPITAL ADMISSIONS FOR TETANUS AND ATS REACTIONS, 1950-56 INCLUSIVE

	Tetanus	*ATS reactions*
Victoria Hospital War Memorial Children's Hospital	8 definite 3 questionable	37
St. Joseph's Hospital	7 definite	23
Westminster (Veterans) Hospital	0	0
Total number of cases	18	60
Total number of deaths	3	0

This figure seemed rather high as judged by day-to-day experience in our area.

Data about the number of hospital admissions for ATS reactions over the period of our study, 1950-56, were easily obtained, and the results are tabulated in Tables I and II.

TABLE II.—COMPARISON OF MORBIDITY OF HOSPITAL PATIENTS, LONDON, 1950-56 INCLUSIVE

	Total hospital days 1950-56	*Average duration of hospital stay (days)*	*Average annual hospital days*
ATS reactions	224.0	3.73	32.0
Tetanus	337.5*	22.5†	48.2

*Total hospital days of survivors (treatment of tetanus only).
†Survivors (treatment of tetanus only).

In spite of the fact that there are many more persons with ATS reaction than tetanus in hospital each year, the former only account for about two-thirds as many hospital days per year as the patients with tetanus. However, this information only begins to define the problem. A very large percentage of such reactions are severe and disabling so far as work is concerned, and yet are treated out of hospital. Others are so rapidly fatal that the opportunity for hospital admission does not occur.

Our next thought was the Dominion Bureau of Statistics. Although ATS reactions are not a reportable disease under the Public Health Act—nor, for that matter, is tetanus—death certificates might be expected to include the required information. Through the kindness of Mr. H. G. Page, Chief of the Vital Statistics Section, Health and Welfare Division, Dominion Bureau of Statistics in

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‡This is not to say that tetanus is not seen in London hospitals. It is. But all these cases originate outside the municipality. Furthermore, the above statements are not to be construed to suggest that the London Academy of Medicine is not convinced of the value of tetanus toxoid immunization. Please see full text of report.[1]

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Ottawa, the entire list of accidental deaths in Canada for 1955 was reviewed. Not a single instance of death attributable to ATS reaction was found.[2] However, "the fact that serum was administered or that there was a reaction, may in many cases not be reported on the death certificate".[2] (Knowing personally of one such death occurring in Western Ontario in 1954, and another in 1958, I looked up the death certificate of the latter and noted that ATS reaction did not appear among the causes of his terminal illness.)

The Workmen's Compensation Board was approached. From an analysis of their data[1, 3] for 1955, we learned that among W.C.B.-insured workmen in Ontario 0.43% of their 61,206 severe* injuries in 1955 were caused by ATS allergic reactions; and that the risk of disability due to severe ATS reactions was 265 times greater than that from tetanus itself. No deaths occurred from either tetanus or ATS reactions that year (Table III).

TABLE III.—ATS REACTION VS. TETANUS MORBIDITY, WORKMEN'S COMPENSATION BOARD, ONTARIO, 1955

	Cases	*Deaths*
ATS reaction*	265	0
Tetanus*	1	0
All injuries*	61,206	0

Ratio of clinical tetanus to severe ATS reactions = 1:265

*Off work four calendar days or longer.

Figures were not available for the other six years of our study, but the incidence of tetanus in W.C.B. experience over the three years 1954-56 inclusive[3] is 1.3 cases per year (with no deaths). Adjusting the T:ATS ratio of 1:265 for this annual tetanus incidence improves the accuracy of the ratio somewhat and gives a revised ratio of clinical tetanus to severe ATS reactions of 1:204.

Now, although the Dominion Bureau of Statistics does not, as yet, keep figures for tetanus morbidity, such data plus mortality figures have been kept in the U.S.A. on a national basis since 1947.[4] They report a mortality rate of 56% for 1955.[4] Assuming that this applies equally well to Canada, where we have an average of 13 deaths per year,[1a] one arrives at an estimated total of 23.2 cases of tetanus annually for a population the size of Canada (estimated at 15,601,000 for 1955, an intercensus year).

If the T:ATS ratio of 1:204 derived from the experience with Ontario residents covered by the W.C.B. applies equally well to other residents of Canada, one arrives by simple arithmetic at an estimated annual Canadian total of severe ATS reactions of 4733.

However, we can base our calculations on the reported average annual incidence of tetanus morbidity in the U.S.A. for the period 1945-57, rather than on the mortality rate and total annual deaths. This would seem a little more precise, and therefore, preferable. An annual incidence in the U.S.A. of 0.3 case of tetanus per 100,000 population is reported,[4] and this, when applied to Canada, would raise the expected Canadian annual incidence to 46.8 cases of tetanus per year. Applying our T:ATS ratio of 1:204 to this gives us a higher figure for severe ATS reactions in the ten provinces per year: 9547.

Now our local experience with tetanus in London during the period 1950-56 inclusive shows an actual mortality rate of 16% (3 of 18 cases), as opposed to the reported U.S.A. national average of 56% for 1955. The low mortality rate of London, if characteristic of Canada generally, would further increase the calculated annual incidence of clinical tetanus in Canada to 81 cases. This in turn would increase our estimate of expected severe ATS reactions to a total of 16,524 cases annually.

If one splits the difference between a mortality rate of 16% and 56%, one gets a mortality rate of 36%. This is probably a more accurate figure than 56%, for the recent tetanus mortality. It is recognized that reporting practices may vary from state to state, and some under-reporting occurs. Furthermore,[3] selected American hospital studies of tetanus of about this same approximate period indicate a fatality rate of treated cases of 33 deaths per 100.[4] For various earlier periods during the last half-century, hospital studies yielded an average ratio of 43 deaths per 100 cases, ranging from 29 to 50 deaths per 100 cases.[4] Using this estimated 36% mortality rate for tetanus and the average annual Canadian deaths from tetanus,[13] plus the above-mentioned W.C.B. ratio of 1:265, we obtain an ATS reaction total of 7364.

TABLE IV.—CANADIAN TETANUS MORTALITY

	Tetanus deaths annually	*Population 1955 intercensus year estimate*	*Tetanus deaths, rate per 100,000 population*
Canada	13*	15,601,000	0.08
Ontario	4.57*	5,183,000	0.08

*Averages of 1950 to 1956 inclusive.

Now the above figures are only estimates, and they may be erroneously high. What factors would tend to distort our ratio of tetanus cases to ATS reaction cases, and thereby erroneously exaggerate our calculated total number of annual expected ATS reactions? Firstly, Ontario may contribute less than other provinces to the total number of deaths per year from tetanus. A comparison of the total deaths from tetanus for Ontario with that for Canada as a whole, when adjusted per 100,000 population, eliminates this error (Table IV). The number of tetanus cases contributed by our province to the Dominion total is, as one might expect, about in proportion to its population.

Secondly, the physicians of Ontario may have twice the success of those in other provinces in keeping patients with tetanus alive; certainly we would appear to use proportionately more pro-

*Severe enough to cause four or more days' loss of work.

phylactic and therapeutic ATS (see Table VI). But the mortality per 100,000 population would appear to make this highly improbable (Table IV).

Thirdly, the validity of the T:ATS ratio may be questioned. It seems reasonable to postulate that ATS reactions and tetanus morbidity (and mortality), because they both stem from the same cause, i.e. a risk injury, must bear some sort of relationship to each other. This relationship can be expressed as the T:ATS ratio, which happens to be 1:204 for the 1955 patient population of the W.C.B. The weakest link in our calculations is the assumption that this ratio can be applied with equal validity across the country to populations other than this, from which it was derived.

TABLE V.—ESTIMATES* OF TETANUS MORBIDITY ANNUALLY IN CANADA

Estimate derived from:	*Cases annually*
Canadian reported mortality data and U.S. reported mortality rate	23.2*
Canadian mortality data and Canadian estimated mortality rate (36%)	36.1*
U.S. reported morbidity data and Canadian census	46.8*
Canadian reported mortality data and observed London mortality rate	81.0*

*N.B.—See text; estimates only.

Let us suppose that people not covered by W.C.B. have twice as great a chance of developing tetanus as do industrial personnel insured by W.C.B. This is not an unreasonable supposition, since our London figures show that all patients with tetanus over a period of seven years came from populations which were not insured by W.C.B.[1] Our T:ATS ratio would change from 1:265 to 1:132, giving a Canada-wide annual incidence of severe ATS reactions between 6177 and 10,692. The lower figure is calculated on an annual Canadian tetanus incidence of 46.8 cases, and the higher figure on an incidence of 81 cases per year (Table V).

TABLE VI.—ATS USED ANNUALLY IN CANADA

	No. of doses of 1500 units distributed	*No. of doses per 100,000 population*
All Canada	136,000*	
Canada (presumably mostly Quebec)	10,092†	
Total	146,092	936.42
Ontario	99,000*	1910.09
Other provinces	47,092	452.02

*By Connaught Medical Research Laboratories in 1957.

†By L'Institut de Microbiologie et d'Hygiène, Université de Montréal, in 1956.

Furthermore, it may be that people insured by W.C.B., as a group, receive a great deal more ATS prophylactically, and therefore have more ATS reactions. There are no actual figures available comparing the frequency of ATS administration to W.C.B.-insured injuries as compared with the rest of the general population. We know that twice as many hospital cases of severe ATS reaction in London followed non-industrial rather than industrial accidents,[1] but this presumably indicates only that there are more people not covered by W.C.B. than are insured by it. If we were to assume that non-W.C.B. persons receive ATS half as frequently as do persons insured by W.C.B., as well as the previous assumption that the former have, at the same time, twice the likelihood of developing tetanus, our ratio would be further reduced from 1:265 to 1:66. This would reduce still further our calculated national annual total of severe ATS reactions to something between 3088 and 5346.

What will we do with this array of figures? Somewhat arbitrarily we may take the average of all estimates: 7933 (Table VII).

TABLE VII.—ESTIMATES OF ATS REACTION MORBIDITY ANNUALLY IN CANADA

16,524	10,692	6177	4733
7364	9547	5346	3088

Average 7933

Is there any way of proving the accuracy of our answer? One method would be to compare it with that derived by a totally different method. Mahoney, at St. Michael's Hospital in Toronto, followed up 2795 patients receiving ATS in the Hospital's emergency department over a 7½-month period during 1955-56.[5] Of these, 148 developed severe enough reactions to require a return to hospital for treatment. That is, 5.3% of those receiving ATS suffered severe allergic reactions.

What percentage does 7933—our estimated reaction incidence—constitute of the total amount of ATS administered annually in Canada? Essentially all of the ATS administered in Canada comes from two sources of manufacture: the Connaught Medical Research Laboratories in Toronto, and the Institut de Microbiologie et d'Hygiène, Université de Montréal.[6] From data listed in Table VI, kindly supplied by Dr. Ferguson of the Connaught Laboratories and Dr. Foley of the Province of Quebec Ministry of Health, and with the information that "the rate of distribution has remained approximately the same for a number of years",[6] we can estimate that about 146,000 doses of ATS are administered annually in the Dominion. Out of 146,000 doses, 7933 reactions would give an incidence of 5.4% reactions—almost identical with Mahoney's figure.[5] Further corroboration is found in Moynihan's report of British experience during 1953-54 for all types of ATS reactions: an incidence of 5.3% reactions in 7580 injections.[11] Therefore, our estimate of about 7900 severe ATS reactions in Canada annually would appear reasonably accurate.

WORK-DAYS LOST BECAUSE OF REACTIONS

We were unable to obtain from the W.C.B. exact data concerning the number of work days lost on

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account of ATS reactions. But we know from the fact that they coded only those losing four days or more, that (a) *at least* 20 times as many days were lost in 1955 from ATS reactions in W.C.B.-insured personnel than from tetanus itself: 1060 versus 58;[3] (b) at this rate, ATS allergic reactions likely cost the country *at least* 31,500 work days annually; (c) in the province of Ontario we must have between 2000 and 3000 ATS reactions each year,* resulting in an annual loss of about 10,500 work days; (d) if in our city the same percentage of patients with severe ATS reactions require hospital stay as at St. Michael's Hospital in Toronto (4.7% of all reactions), then we can calculate an annual incidence for London of 182 severe ATS reactions (95% of whom are not sent to hospital, and most of whom originate within the London area). At four days' lost work per man this amounts to 728 days lost per year from this cause. This should be compared with the data in Table II, which indicates that there are 48.2 days spent in hospital annually owing to tetanus (all such persons must be put in hospital, and all cases originated *outside* London).

DEATHS FROM REACTIONS

To these totals we can probably add a few deaths annually. That is the closest estimate we can make. It would be interesting to know more exactly just how closely this mortality figure, if it were obtainable, would approximate the Canadian mortality from tetanus itself: 13 cases each year. An incidence of one death in every 50,000 to 200,000 ATS injections has been quoted by Laurent and Parish,[8] who based this admittedly rough estimate on the literature. In their standard text on allergy, Vaughan and Black[9] consider this question and arrive at the opinion that alarming and fatal reactions after ATS are by no means as rare as reports would indicate—an opinion with which this writer would tend to concur on the basis of local experience and on that of various allergists in the eastern U.S.A. and Canada with whom this matter has been discussed.

Fatal accidents occur frequently enough that the public health authorities (who provide the free distribution of ATS) might well consider the advisability of attempting to define the incidence of these deaths more precisely by making sure that such deaths are reported and that the importance of ATS allergy as the cause of death is correctly stated rather than a pathological diagnosis only.

It may be profitable to consider a few examples of the disease under discussion.

FATAL ANAPHYLACTIC SHOCK DUE TO INITIAL ATS SKIN TEST

S.B., a 21-year-old woman, fell on the street, and suffered abrasions and lacerations. The next day she went to her doctor and requested ATS. Her doctor demurred in view of her life-long history of asthma. But the patient insisted. An intradermal test was done with ATS (full strength). The patient "tightened right up in her chest", and died in 10 minutes. She was known to be sensitive to horses.

Post-mortem examination revealed fluid blood, and pulmonary emphysema with distended dry lungs with some microscopic congestion and a few eosinophils in the alveolar walls. Bronchi were clear except for a little sticky mucus. Bronchiectasis, slight and generalized, was present, and a dermoid cyst of the right ovary was found.

This is a typical instance of the naturally occurring atopic type of horse serum allergy, many instances of which are reported in the literature (and many more of which go unreported). It illustrates two useful points: First of all, as Gottstein recognized in 1896[10] and as has been recently reemphasized by Parish[12] and Alexander,[13] these patients die with the *first* injection of horse serum. You never have a history of previous injection and/or reaction to the drug. An alert clinical suspicion is the *only* way to avoid this type of accident. A patient with such a history should be considered to have a very high risk of severe allergic reactions from ATS.

Secondly, the recommendations of the coroner's jury in this case, and the manufacturer's suggestion that a tenfold dilution of the serum be used for preliminary skin testing, are both almost certainly not sufficient to avoid death in a person so acutely sensitive. On the basis of everyday experience in dealing with similarly allergic (atopic) individuals, a millionfold dilution would be a reasonable starting strength for test purposes in such a case where the clinical story obviously indicates that a high risk of severe sensitivity exists. In order to explain the basis for this opinion it is necessary to point out that allergists, in daily dealings with atopic persons, use a variety of test allergens, including extracts of horse (and other animal) epithelia, pollens, etc. Empirically over the past 50 years they have arrived at an initial test strength of the order of 100 P.N.U.* per c.c. This applies to both the above-mentioned allergens when a test dose of 1/20 to 1/10 of a c.c. is to be injected intradermally. These arbitrary test doses may be, and occasionally are, reduced further if a patient is suspected of being unusually highly sensitive.

The ATS of the Connaught Medical Research Laboratories assayed in our laboratory contains more than 2700 micrograms protein nitrogen per c.c. That is, the test strength of ATS given to this girl, and the test strength usually recommended for use by the manufacturers of the serum, would be respectively greater than 25,000 and greater than 2500 times stronger than that which allergists have empirically found safe and practical for

*We may have more if, as the data concerning provincial distribution of ATS would suggest (Table VI), Ontario uses relatively more ATS than the rest of Canada.

*1 P.N.U. = protein nitrogen unit = 0.01 micrograms protein nitrogen.

ordinary use in the diagnostic testing of the (atopic) allergic population.* As a corollary it will be evident that halving the test dose (from 1/10 to 1/20 c.c.), or diluting the serum tenfold will not remove one from the danger zone in dealing with these highly allergic individuals. Nor should the use of the scratch technique be allowed to lull one into a false sense of security. Fatal reactions to scratch tests have occurred. The strength of the testing solution is *at least* as important as the method used. It is necessary to dilute the antigen by something of the order of 1:100,000 or even more for a safe initial test dose. In clinical allergy these points are well demonstrated by an interesting naturally occurring analogue to ATS allergy: anaphylactic sensitivity to insect venoms—bee, wasp, hornet, etc. Mueller has reported on his experience with preliminary testing of 55 persons. Whereas he previously believed dilution of the extract concentrate by 1:1,000,000 to be a safe level at which to begin testing, several severe reactions to this dose intradermally caused him to revert to the cruder scratch technique. When this also proved inadequate to avoid trouble, he eventually adopted a dilution of 1:100,000,000 as a safe initial test strength and now recommends this for general usage.[14] The general method of preliminary testing described by him would be that used by most allergists in dealing with anyone in whom a high risk of intense allergy to ATS was suspected, rather than the method advocated by the coroner's jury as noted above—however safe and practical their recommendation might be for dealing with cases of no or slight sensitivity to the serum.

FATAL ACUTE HÆMORRHAGIC LEUKOENCEPHALITIS DUE TO ATS INJECTION

L.B., a 48-year-old man, received an ATS (1:100) scratch test, which was reported negative; 1500 units ATS was given. There was no known previous ATS administration or atopic disease. He had had an acute coronary occlusion 2½ months previously.

Generalized urticaria developed seven days later and he went into coma on the eighth day. Bilateral Babinski signs and sustained clonus were present. Optic discs were flat. The patient was febrile, with a low blood pressure. Petechiæ were present. He was treated with hydrocortisone and hypothermia, but died without recovering consciousness on the thirteenth day.

Post-mortem examination revealed the following: (1) acute necrotizing hæmorrhagic encephalopathy, (2) acute toxic splenitis, (3) pulmonary œdema, (4) bronchopneumonia, (5) albuminous degeneration of liver, kidneys and adrenals, (6) coronary arterial sclerosis, with stenosis and organizing and fresh thrombus, (7) myocardial infarct (organizing), and (8) arteriolar nephrosclerosis.

This is an unusual instance of the acquired type of horse serum allergy. This particular type of case is extremely rare, and completely unpredictable in its occurrence with the limited knowledge we possess today of the pathogenesis of these allergic processes.

SUMMARY

About 7900 severe allergic reactions to ATS are estimated to occur annually in Canada. The problem of disease due to ATS allergy in this country would appear to approximate and in some respects to surpass that due to tetanus itself.

Three things are essential in order to reduce the magnitude of the clinical problem: (1) less ATS must be given; (2) as many individuals as possible must be immunized with tetanus toxoid; and (3) a permanent record of this immunization must be kept, preferably in a central registry.[1]

The reason for (1) is self-evident. The less ATS given, the fewer reactions there will be. No more effective method of controlling the incidence of this disease could possibly be devised. With regard to (2), the more individuals actively immunized against tetanus, the less ATS will be required. In fact, it is *only* after such active immunization that we may justifiably omit the prophylactic use of ATS in individuals clearly at risk from tetanus. Furthermore, the protection against tetanus conferred by such toxoid immunization is more efficient and long lasting than that conferred by ATS alone. The practical importance of (3) will be obvious to anyone who confronts this problem of tetanus prophylaxis in the course of his day-to-day practice. It has been enunciated repeatedly over the past several decades in the world literature on tetanus. Suffice it to point out here that, in the absence of (2) *and* (3), (1), the primum desideratum for controlling this disease, cannot be fully achieved.

The toxoid is safe, effective, and free. Our provincial and federal health authorities are powerless to act on (3), without initiative from the profession itself.

Since all of these reactions follow ATS administration and since practically all of the ATS used annually is given by surgeons and general practitioners, these two groups should have a special interest in this problem.

I wish to express my appreciation to the doctors concerned for permission to publish the details of these cases; and to acknowledge my indebtedness to Dr. Paul Walden for the information about tetanus in Tables I and II, and to the late Dr. A. W. Banghart, who was a member of the Tetanus Toxoid Committee, for the information on ATS reactions found in Tables I and II.

*This should not be construed as a potency ratio. The percentage of the horse serum globulin in ATS which may be actively allergenic is not established. Theoretically any or all of it could be allergenic. The above data serve only to indicate in a general way an area of dangerous uncertainty that exists with regard to the practice of skin testing for ATS allergy. More precise data in this field are needed.

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RÉSUMÉ

On estime qu'il se produit environ 7900 réactions allergiques graves au sérum antitétanique chaque année au Canada. Cette allergie pose un problème dont l'importance égale ou même dépasse celle du tétanos lui-même. La solution du problème repose en grande partie sur trois suggestions qu'offre l'auteur.

La première consiste à diminuer la quantité de sérum antitétanique employée chaque année. Il est évident que les réactions allergiques diminueront en proportion. En deuxième lieu, il suggère que le plus grand nombre de sujets possible soient immunisés à l'aide d'anatoxine, ce qui réduirait de beaucoup le besoin d'administrer du sérum antitétanique lorsque les risques de tétanos sont bien établis. On sait que l'immunité conférée par une telle injection dure plus longtemps que celle offerte par le sérum antitétanique. Enfin, il serait désirable qu'un bureau central de renseignements soit institué permettant au médecin traitant de connaître à quelques moments d'avis si son malade a déjà été immunisé et à quelle date. Ces trois recommandations ne sauraient être mises en vigueur sans l'appui des départements d'hygiène provinciaux et fédéraux secondés par tout le corps médical du pays.

HYSTERECTOMIES AT THE WINNIPEG GENERAL HOSPITAL* (FROM JUNE 1, 1956 TO MAY 31, 1957)

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INTRODUCTION

PELVIC surgery has been under very critical review recently in both medical[1-6] and popular lay journals. Removal of the female pelvic genital organs in particular has been the subject of many of the articles, and doubt has been cast on the validity of the indications for many of the operations. Miller[1] has drawn a parallel between the hysterectomy "epidemics" of today and the appendectomy-tonsillectomy "epidemics" of yesteryear. This should affect the thinking of the medical profession, and the effect of the lay publications on the patients' attitude to these surgical procedures must not be ignored or minimized.

Only after critical self-analysis have various centres been able to improve their standards. It is felt, therefore, that a review of the hysterectomies performed at the Winnipeg General Hospital would be of interest. This has been undertaken, not as a form of criticism or with any expressed intention of sitting in judgment, but merely to determine the factual unbiased information about this type of operation in this centre. Case records from June 1, 1956, to May 31, 1957, were selected for review.

RESULTS OF REVIEW

Types of Hysterectomy

During the period of study 146 hysterectomies were performed including subtotal, total abdominal and vaginal hysterectomies. Of these 21 were subtotal, 106 were total abdominal and 19 were vaginal hysterectomies. There were no operative deaths.

TABLE I.—TYPES OF HYSTERECTOMY

	Winnipeg General Hospital		*Miller (1946)*	
Type	*No. of cases*	*%*	*No. of cases*	*%*
Subtotal	21	14.4	162	65.8
Total abdominal	106	72.6	72	29.2
Total vaginal	19	13.0	12	4.8
	146	100	246	99.8

Table I compares these figures with those of Miller who reviewed 246 hysterectomies performed from January to April 1955, in ten hospitals, large and small, in ten communities of three midwestern states. From these figures it is seen that the percentage of total hysterectomies for this centre is greater. Lewis[7] reported on 1967 hysterectomies at the Chelsea Hospital from 1948 to 1954. The number of subtotal hysterectomies performed fell from 47% in 1948 to 7% in 1954. Table II divides the subtotal hysterectomies into three groups to give the number performed by general practitioner, general surgeon and gynæcological surgeon.

TABLE II.—SUBTOTAL HYSTERECTOMY CLASSIFIED ACCORDING TO OPERATOR

Operator	*No. of cases*	*%*	*% of total series*
General practitioner	4	19.1	2.7
General surgeon	10	47.6	6.8
Gynæcologist	7	33.3	4.8
	21	100	

Of the 14 subtotal hysterectomies in this series performed by a general surgeon or general practitioner, 13 were either for fibromyomas or for profuse bleeding. The one exception, performed by a general surgeon, was for an undiagnosed mass in a patient who had been treated for carcinoma of the cervix with radium 21 years previously. The eventual pathological diagnosis was adenocarcinoma of the corpus uteri with hæmatometra. The four subtotal hysterectomies performed by a general practitioner were all by the same individual. Of the

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ten subtotal hysterectomies performed by a general surgeon, eight were by one individual and the remaining two by a second individual. The operative reports suggest that this procedure was adopted by choice rather than by necessity. Of the seven subtotal hysterectomies by a gynæcological surgeon, two surgeons each performed two, and three others each performed one. In two of these cases a single horn of a bicornuate uterus was removed. One was for hæmatometra in a case of congenital absence of the vagina. The other operation was for a residual horn and double cervix, where one horn had been previously removed. In the remaining five cases it was clearly stated that the subtotal hysterectomy was carried out for technical reasons in a difficult situation. In two of these, the cervix was deeply coned from above, leaving a thin rim of the portio vaginalis cervix, and the operation described as a "total" hysterectomy. These are recorded in this series as subtotal hysterectomy.

Age

The age groups of patients undergoing the operation are tabulated and compared with Miller's group in Table III. The greatest difference in the two series is in the age group 20 to 39 years which makes up a much higher percentage in Miller's series.

TABLE III.—AGE INCIDENCE

	Winnipeg General Hospital		*Miller*	
Age	*No. of cases*	*%*	*No. of cases*	*%*
0 - 19	1	0.7	1	0.4
20 - 39	27	18.5	108	43.9
40 - 49	101	69.2	130	52.8
60 and over	17	11.6	7	2.8
	146	100	246	99.9

Psychological Effect of Hysterectomy

Severe adverse psychological reaction from operations on the female genital tract is well documented. Inadequacy and other psychosomatic syndromes may occur in married women but are more likely to develop in childless women or ones who have hope of marrying, or remarrying, even if they have passed their period of childbearing. Menzer *et al.*[8] have pointed out that the intensity of the reaction has little bearing on the extent of anæsthesia, surgery, or blood loss, but has a direct bearing on intensity, duration and tolerance of emotional suffering resulting from the loss of the uterus. Dalton, Crosby and Beattie[5] reported loss of marital happiness in 44% of 43 married women subjected to hysterectomy. Bradford[9] also cautions that "pelvic surgery will not correct the psychic symptoms and woe betide the gynæcologist who thoughtlessly operates upon an emotionally disturbed, constitutionally inadequate patient because he then has as an aftermath of his operation many complaints and problems". Bryans[6] advises that when a surgical procedure is clearly not an emergency, a period of observation will do much to clarify the picture. This allows time for the necessary total assessment of the patient and the proper weighing of the physical and psychic factors involved.

Marital Status and Parity

TABLE IV.—MARITAL STATUS

Marital status	*No. of cases*	*%*
Single	22	15.1
Widowed	12	8.2
Separated	2	1.4
Married	110	75.3
	146	100

Marital status, the number of children and the desire for more children are extremely important factors which may have an important bearing on the psychosomatic symptomatology. Tables IV and V give the marital status and parity of the group of women under consideration. Lack of long-term follow-up does not allow assessment of the psychological effect of hysterectomy in this series of patients.

TABLE V.—PARITY

No. of children	*No. of cases*	*%*
0	40	27.4
1 - 2	49	33.6
3 - 5	40	27.4
6 plus	16	10.9
Not recorded	1	0.7
	146	100

Presenting Complaints

The complaints recorded are an expression of the patients' main presenting complaints as given to the intern or attending doctor at the time of admission, and not of all the associated symptoms elicited on review of systems. The terms used are defined as follows:

"Mass" signifies an actual lump felt by the patient but does not differentiate an abdominal from a pelvic mass.

"Pain" includes abdominal pain, pelvic pain, and dysmenorrhœa, but not backache.

"Bleeding" includes cyclic and non-cyclic bleeding without regard for amount, or relation to menopause.

"Gastro-intestinal" symptoms include flatulence, dyspepsia, nausea, vomiting and diarrhœa, but not constipation.

Only two patients presented themselves for routine examination without complaints. However, this figure may be misleading, as the histories of several cases suggest that these patients actually went to their physicians for routine examinations, but after admission to the hospital for surgery gave

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TABLE VI.—PRESENTING COMPLAINTS

Entrance complaints	*W.G.H.*		*Doyle (6248 cases)*		*Miller (246 cases)*	
	No.	*%*	*No.*	*%*	*No.*	*%*
Bleeding	94	64.4	4459	71.4	102	41.4
Pain	34	23.3	2306*	36.9	53	21.5
Mass	12	8.2	300	4.7	23	9.3
Discharge (non-bloody)	13	8.9	434	6.9	9	3.6
Backache	1	0.7	705	11.3	13	5.2
Descensus	8	5.5	—	—		
Pruritus	3	2.1	—	—		
Urinary trouble	9	6.2	390	6.2		
Headache	2	1.4	—	—		
Tiredness	3	2.1	124	2.0		
Gastro-intestinal tr.	5	3.4	—	—		
Constipation	3	2.1	40	0.6		
Dyspnœa	1	0.7	—	—		
Weight loss	1	0.7	25	0.4		
Ankle œdema	1	0.7	—	—		
Angina pectoris	1	0.7	—	—		
Abdominal swelling	1	0.7	157	2.5		

*Not including dysmenorrhœa 476 (7.6%).

the intern a retrospective history based on symptoms stressed by their physicians. Table VI lists the entrance complaints and compares their frequencies in the Winnipeg General Hospital series with that of Miller and of Doyle.[15] The latter discusses 6248 hysterectomies performed in 35 institutions in California in 1948.

Signs and Symptoms

Tables VII and VIII indicate the type and duration of the main symptoms. The shortest period of time was one day in a case of an ovarian cyst where the patient presented with nausea, vomiting

TABLE VII.—SIGNS AND SYMPTOMS

	No. of patients	*%*
Bleeding	99	67.8
Discharge	24	16.4
Pain	45	30.8
Mass	54	37.0
Urinary	15	10.3

and diarrhœa. The longest period of time was 29 years in a case of utero-vaginal prolapse. In the latter case, however, the presenting complaints of heavy menses and watery vaginal discharge had been present for only two months.

TABLE VIII.—DURATION OF SYMPTOMS

Time (months)	*No. of patients*	*%*
Less than 1	15	10.3
1 - 6	46	31.5
7 - 12	26	17.8
More than 12	58	39.7

Table IX lists the main complaints and their duration.

TABLE IX.—DURATION OF INDIVIDUAL COMPLAINTS

	Duration (months)			
Complaint	*Less than 1*	*1 - 6*	*7 - 12*	*More than 12*
Bleeding	11	29	15	38
Discharge	4	3	2	5
Pain	4	11	3	16
Mass	1	3	3	5
Urinary	—	2	1	6
Pruritus	—	—	—	2
Descensus	—	2	2	4

Hæmoglobin Levels

The hæmoglobin levels are recorded in percentages, as some are taken from various clinic records brought in with the patient. In these cases it is not known which method of determination was used. The majority of the determinations were made in the hospital by photoelectric methods at the time of admission, or preoperatively in long-stay patients.

TABLE X.—RANGE OF HÆMOGLOBIN LEVELS

Hæmoglobin %	*No. of patients*	*%*
Less than 50	3	2.1
50 - 59	12	8.2
60 - 69	10	6.8
70 - 79	25	17.1
Over 80	69	47.3
Not recorded	27	18.5

All of the hæmoglobin levels were determined within one week before the operation and were intended to indicate the preoperative level. None of the patients in this series received preoperative blood transfusions. The 27 hæmoglobin levels listed as "not recorded" include some in which the last preoperative hæmoglobin determination was made more than one week before the operation. The remainder of this group consists of cases where no hæmoglobin value is recorded on the hospital chart although the value may have been determined in the doctor's office before admission.

In most cases only a single determination was available from the hospital records. Dalton has pointed out the danger of diagnosing anæmia due to menorrhagia on the basis of a single hæmoglobin value, and the relationship of the hæmoglobin level to various factors, including the time of the menstrual cycle and hæmodilution.

Procedures Used in Establishing Diagnosis

These were studied to assess the use of methods other than laparotomy in establishing diagnosis before definitive surgery. They are listed in Table XI.

All except three of the curettages were performed within one year of the definitive surgery. Of these three, one was five years, one four years, and one three years before hysterectomy. In none of these three was a repeat curettage carried out prior to definitive surgery. In ten cases there was one other

TABLE XI.—PROCEDURES USED IN ESTABLISHING DIAGNOSIS

Procedure	*No. of patients*	*%*
Cytological smear	14	9.6
Cervical biopsy	19	13.0
Curettage	69	47.3
Smear and curettage	5	3.4
Smear and cervical biopsy	0	—
Curettage and cervical biopsy	8	5.5
Smear, curettage and cervical biopsy	3	2.1
Colpotomy	0	—
Culdoscopy	0	—

previous curettage and in two cases there were two previous curettages. In two cases cervical biopsy had been performed twice. In both the first biopsy was done five years before the last one. In one case smears were made on two occasions before the operation. Curettage was the most frequently used accessory diagnostic procedure. The need for freer use of the curettage and other less radical agents before definitive surgery has been stressed by many, including Payne[3] and Lee.[10]

Associated Surgical Procedures

Table XII gives the frequency of surgical procedures associated with hysterectomy.

TABLE XII.—SURGICAL PROCEDURES ASSOCIATED WITH HYSTERECTOMY

Procedure	*No.*	*%*
Unilateral salpingo-oophorectomy	23	15.8
Bilateral salpingo-oophorectomy	48	32.9
Unilateral salpingectomy	7	4.8
Bilateral salpingectomy	1	0.7
Ovarian suspension	1	0.7
Ovarian cystectomy	2	1.4
Ovarian biopsy	1	0.7
Ovarian graft	1	0.7
Vaginal repair (with vaginal hysterectomy)	18	12.3
Colpoperineorrhaphy (with abdominal hysterectomy)	1	0.7
Appendectomy	17	11.6

Forty-eight bilateral oophorectomies were done. Of the 23 unilateral salpingo-oophorectomies, four were in patients in whom the opposite ovary had been previously removed. In three of these four there was no obvious indication for removal of the second ovary. In one the remaining ovary was removed for technical reasons and an ovarian graft placed in the anterior abdominal wall.

The complete effects of oophorectomy are difficult to assess but should be given careful consideration before normal ovarian tissue is removed during pelvic surgery. Most prominent are the psychological and functional disturbances which follow removal of ovaries in premenopausal women. The effects of oophorectomy in postmenopausal women are not so striking, but may nonetheless be present.

Green-Armytage[11] has pointed out that the incidence of coronary atheroma in the castrated female approximates that in the male, in contrast to the normal female to male ratio of one to ten.

Hysterectomy alone may result in ovarian atrophy. Usually the ovaries receive only part of their blood supply from the uterine artery.[12] However, it has been demonstrated that in a small percentage of cases the ovaries received their main blood supply from the uterine artery and may atrophy after hysterectomy.

Pathological Findings from Tissue Removed

Pathological findings in the tissues removed at operation are tabulated in Table XIII.

TABLE XIII.—PATHOLOGICAL FINDINGS FROM TISSUE REMOVED

Pathology	*No.*	*%**
Ovarian		
Primary cystadenocarcinoma	3	2.1
Secondary carcinoma	1	0.7
Granulosa cell tumour	1	0.7
Benign cystadenoma	5	3.4
Physiological cysts	2	1.4
Endometriosis	5	3.4
Parovarian cyst	2	1.4
Chronic salpingitis	5	3.4
Uterine corpus		
Physiological endometrium	25	17.1
Follicular	12	8.2
Lutein	10	6.8
Atrophic	3	2.1
Non-physiological endometrium	19	13.0
Endometrial hyperplasia	2	1.4
Endometrial polyps	17	11.6
Fibromyoma	64	43.9
Adenomyosis	10	6.8
Reduplication	2	1.4
Pregnancy	2	1.4
Malignant lesions	21	14.4
Adenocarcinoma	20	13.7
Mixed mesodermal tumour	1	0.7
Uterine cervix		
Benign	11	7.5
Cervical polyp	3	2.1
Chronic cervicitis	8	5.5
Malignant	9	6.2
Epidermoid carcinoma	4	2.8
Carcinoma in situ	5	3.4

*Based on total number of cases (146)

Physiological endometrium has been listed as a finding only in the 25 cases where no pathological lesion was found. Of these, 12 were in uteri removed for uterovaginal prolapse.

Similarly, chronic cervicitis has been reported only where it has been listed on the pathologist's report and when no other pathological change was demonstrated. Of the eight cases of chronic cervicitis, four were in uteri removed for uterovaginal prolapse. In one case the indication for operation was stated to be chronic cervicitis and the pathology report listed only minimal chronic cervicitis.

Two uteri were reported to be pregnant. Of these one was removed by a general practitioner from a 44-year-old patient who had been bleeding for three weeks. A curettage was done before hysterectomy but there is no record that tissue was submitted to the pathology department. A

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TABLE XIV.—ASSOCIATION OF OTHER LESIONS WITH FIBROMYOMA

Lesion	*No.*
Granulosa cell tumour	1
Bilateral serous cystadenoma	1
Bilateral parovarian cyst	1
Endometriosis	2
Chronic salpingitis	2
Adenomyosis	1
Carcinoma of corpus	4
Endometrial of polyp	8
Cervical polyp	1
Carcinoma of cervix	2
Total	23

diagnosis of submucous fibroid was made. The other was removed by a gynæcological surgeon for uterovaginal prolapse in a 39-year-old patient. The pathology report read: "Pregnancy, probably a missed abortion".

In the four cases of invasive carcinoma of the cervix a radical hysterectomy with lymph node dissection was performed.

Not infrequently other lesions are associated with fibromyomas and with endometrial polyps. Such association was present in 23 cases of fibromyoma and in 11 cases of endometrial polyp. Table XIV shows the association of various lesions with fibromyoma.

TABLE XV.—DURATION OF POSTOPERATIVE PERIOD IN HOSPITAL

Type of hysterectomy	*No. of days' postoperative care*											
	9	*10*	*11*	*12*	*13*	*14*	*15 to 20*	*21 to 30*	*31 to 40*	*41 to 50*	*Total cases*	*Average days*
Subtotal	2	4	4	2	1	2	5	1		0	21	13.0
Total abdominal	12	10	20	20	9	9	21	4		1	106	13.3
Vaginal	9	3	1	2	3	5	3	1		0	19	13.5
	23	17	25	24	13	16	29	6		1		

It is often difficult to be certain which is responsible for the presenting signs and symptoms. Since fibromyomas are so common and so often asymptomatic, one cannot conclude that a fibromyoma is the cause of the symptoms.

Postoperative Course and Complications

The average length of postoperative care was almost identical for subtotal, total abdominal and vaginal hysterectomies, varying only from 13 to 13.5 days. Only 5% in each group required 20 to 30 days of postoperative care. Seventy-five per cent were discharged in two weeks or less. The hospital complications were mainly from wound infections.

APPRAISAL OF NEED FOR SURGERY

Much time is now being devoted in the hospital to quality control of the practice of medicine. Among other things, this involves careful evaluation of the justification for the different operations in that hospital.

It is difficult to evaluate this in a retrospective type of study where assessment of the work done by others must be from records alone. Everyone realizes the variable reliability of patients' histories. Numerous incomplete records increase the difficulty, and, as Doyle has indicated, some cases labelled "unjustified" may spell carelessness in keeping records rather than unjustified surgery. In addition, the lack of any records of long-term follow-up of these patients prevents reliable correlation of the surgical procedure with relief of symptomatology. Dalton justly points out this lack when he states that gynæcologists may feel that their operation is a success because they only see their patients from two to six months postoperatively and at a time when they are still happy with their recovery from a major operation but before they have returned to the stresses and strains of everyday life, and before intercourse has been normally resumed. In many women the complaints continue after operation.

With the above limitations in mind, an attempt was made to evaluate the operative procedures in this series. This has been done by assessing individually the known facts as derived from the records in each case.

Table XVI gives a summary of the evaluation of this series of hysterectomies. In 22 cases no correlation was apparent between the preoperative diagnosis and the eventual pathological findings. In one case the correlation seemed questionable. In 18 cases the pathology report showed no definite

TABLE XVI.—CORRELATION

	Positive		*Questionable*		*None*	
	No.	*%*	*No.*	*%*	*No.*	*%*
Clinical pathological correlation	123	84.3	1	0.7	22	15.1
Correlation of entrance complaints with pathological findings	126	86.3	2	1.4	18	12.3
Justification of hysterectomy	120	82.2	8	5.5	18	12.3

TABLE XVII.—COMPARISON OF JUSTIFICATION

	W.G.H. 146 cases		*Doyle 6248 cases*	*Miller 246 cases*
	No.	*%*	*%*	*%*
Not justifiable	18	12.3		
Questionable	8	5.5	5.2 to 83.7* 39.3 (average)	32.8*
Total	26	17.8		

*Includes those not justified and those of questionable justification.

relationship to the entrance complaints. In two the relationship was questionable. In 18 there did not seem to be any justification for the hysterectomy. In eight additional cases the justification was questionable.

In Table XVII these figures are compared with those reported by Miller and by Doyle, giving comparison with figures derived from 45 institutions.

SUMMARY

A review of 146 hysterectomies performed during the period from June 1, 1956, to May 31, 1957, at the Winnipeg General Hospital is presented. The individual aspects of the cases are assessed. A comparison is made with other centres, and an attempt is made to evaluate the justification of each operation in the series.

The percentage of subtotal hysterectomies in the series is comparatively low, but it would appear that almost half of these incomplete operations were performed by choice rather than for any acceptable indication. No significant difference in hospital stay after subtotal and total hysterectomy was found. The frequency and duration of signs and symptoms have been recorded. Surgical procedures associated with hysterectomy have been listed with some emphasis on the effects of oophorectomy and ovarian atrophy secondary to hysterectomy.

Correlation of pathological findings with symptomatology was attempted and found to be positive in approximately 85% of cases. Hysterectomy was judged to have been justified in about 82% of cases. In this regard it has been stressed that such correlation can only be approximate because accurate and complete records are not always available. It should also be emphasized that one year's experience has been selected as a random sample for purposes of discussion and comparison in the hope that this may reflect the overall picture in this hospital. This picture may change from year to year.

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RÉSUMÉ

Dans une revue des hystérectomies pratiquées à l'Hôpital Général de Winnipeg entre juin 1956 et mai 1957, on compta 146 interventions dont 21 (14.4%) étaient subtotales. Il semble qu'environ la moitié d'entre elles ne furent pas dictées par les circonstances mais bien plutôt relevèrent du choix délibéré de l'opérateur. On n'observa aucune différence appréciable dans la durée d'hospitalisation entre une hystérectomie totale et une hystérectomie subtotale. Les auteurs fournissent une liste des différentes interventions chirurgicales pratiquées en même temps que les hystérectomies. Dans la présente série il existe une corrélation positive entre les données anatomopathologiques et la symptomatologie dans environ 85% des cas. Du point de vue rétrospectif il apparaît que dans 82% des cas l'hystérectomie fut justifiable. Ces chiffres ne peuvent être qu'approximatifs puisque les dossiers ne contiennent pas toujours tous les détails nécessaires à un tel recensement. Ce tableau ne reflète que l'expérience d'une année, il peut changer d'un an à l'autre, mais il semble indiquer la tendance actuelle dans cette institution.

LEVARTERENOL (LEVOPHED) THERAPY IN ACUTE MYOCARDIAL INFARCTION*

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THE USE OF levarterenol (Levophed) as a means of raising the systemic blood pressure during hypotension of varying origin has become widely adopted, and has the advantage over the use of other drugs of being strictly physiological.[1] There is no longer any doubt that this vasopressor agent, also known as L-noradrenaline and L-norepinephrine, has saved the lives of many patients, especially after severe myocardial infarction complicated by acute hypotension.[2-5] This sympathomimetic primary amine was first synthesized in 1904 and has been found in blood, urine, the adrenal medulla, and particularly in phæochromocytoma. Hypotension occurs in about 10% of patients with acute myocardial infarction and is probably primarily due to the inability of the left heart to maintain an adequate output (cardiogenic shock), as well as to failure of peripheral response. If the hypotension is not quickly reversed, the condition results in a mortality rate of 80% or higher.[6] When the blood pressure falls below 80 mm. Hg systolic, the patient usually dies.[7] In all age groups, use of levarterenol has been shown to combat this condition better than any other therapy, such as retrograde arterial infusions or cortisone administration, and the drug is more effective than any other vasopressor agent.[6, 8] It slows the pulse rate and increases total peripheral

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resistance by causing generalized vasoconstriction of arteries, capillaries and veins (although it produces coronary vasodilatation).[9] Thus the blood pressure is elevated and the mean aortic pressure rises, producing a proportionate increase of coronary flow with minimal side effects such as severe arrhythmias. At the same time there is a decrease in renal plasma flow[10] and a rise in the filtration fraction owing to efferent glomerular arteriolar constriction. Thus there is a greater effective filtration pressure and an increase in urinary output. Levarterenol does not produce central nervous system stimulation and tachycardia with the associated anxiety, discomfort and peculiar feelings that follow administration of epinephrine (adrenaline). It is also eight times less toxic. Because of the increase in pulmonary arterial, capillary, and venous pressures, the possibility of aggravating or producing pulmonary œdema must be considered, especially in patients who already have congestive heart failure.

Levarterenol is the safest vasopressor drug because of its evanescent effect. Compare this to the so-called simpler intramuscular drugs (such as mephentermine) which may result in an action up to two hours and cannot be terminated promptly if for example an arrhythmia occurs—this rarely happens as a result of vasopressor agents unless the blood pressure is raised too high.[11] As a matter of fact, levarterenol may successfully terminate arrhythmias that are not infrequently associated with hypotension (such as premature systoles, atrial and ventricular tachycardias, atrial fibrillation, sinus bradycardia and heart block), or it may serve to correct the severe hypotensive state until anti-arrhythmic agents, such as quinidine, take effect.

INDICATIONS

The proper time to begin levarterenol therapy is most important. Should one wait, as has been the custom, until actual signs of shock occur? Griffith *et al.*[6] defined shock as a condition of marked hypotension lasting for an hour or longer, and accompanied by signs of peripheral circulatory collapse. In a patient whose blood pressure had previously been within normal limits, a systolic blood pressure reading of 80 mm. Hg or below was accepted as evidence of shock; and a formerly hypertensive patient with a systolic blood pressure of 100 mm. or below was likewise considered to be in a state of shock. All agree that the longer the delay in instituting adequate levarterenol therapy, the less the chance of survival.[8] Therefore, the author feels that one should not wait for the actual signs of shock. If the systolic blood pressure remains under 80 to 85 mm. Hg (or under 90 to 95 mm. in a known hypertensive) in spite of oxygen and adequate morphine (or meperidine) for from one to three hours, levarterenol should be started. If the blood pressure is dropping, or the patient is in a state of shock at the time he is being sent to the hospital, an order should be given to have levarterenol ready on arrival, along with the oxygen tent. If clinical evidence of peripheral vascular collapse is present (and not only a drop in blood pressure), it should be begun immediately. This is because an apparently "irreversible" state may develop after several hours (or sooner), but if the blood pressure is artificially maintained with levarterenol (even for days) the condition is more likely to become self-correcting, i.e. reversible.[7] Systolic ballooning of the ventricular myocardium seems to be related to shock and is corrected by relief of the shock. If shock is associated with coronary pain only, it is of the mild type, and some authorities[12] suggest delaying levarterenol therapy for half an hour (at the most) in order to see if the shock is reversed by the relief of pain. However, we feel that it is wiser to wait no longer than the time it takes to get the drug ready for administration.

Shock may be partly or entirely due to other factors which should be treated at the same time that levarterenol therapy is begun, such as severe congestive heart failure, ventricular or supraventricular tachycardia, diabetic acidosis, hæmorrhage, infection, pulmonary infarction, cerebrovascular accident, hypotensive drugs, or even morphine sulfate itself.

Both high and low venous pressure types of shock will respond to levarterenol alone. Digitalis is not routinely indicated but should be given (in addition to levarterenol therapy) when definite congestive failure is also present, at which time it may be life-saving.[7, 8, 12]

METHOD OF ADMINISTRATION AND DOSAGE

Levarterenol (Levophed) solutions are prepared by adding 4 c.c. (one ampoule) of levarterenol bitartrate, 0.2% (equals 0.1% base), to 1000 c.c. of 5% dextrose in distilled water. The resultant solution contains 4 micrograms of base (8 micrograms of bitartrate) per c.c. The infusion should be started at seven to 10 drops per minute and should be gradually increased to 60 drops per minute if necessary in order to keep systolic blood pressure over 100 mm. Hg (over 120 if the patient has been hypertensive). A good rule is that if a rate exceeding 60 drops per minute is required to maintain the systolic blood pressure as noted, another ampoule of levarterenol should be added within five to ten minutes. If the desired response is going to be obtained with a certain strength of solution, it is usually instantaneous, and much valuable time is lost if there is further delay before increasing the concentration. In order to limit the total amount of fluid administered or to elevate the blood pressure if the rise has been insufficient, one should gradually increase the concentration but not give 80 to 100 or more drops per minute, as has been the custom. The object of this therapy is to adjust the rate of flow to maintain the blood

pressure at the desired level, with the minimum rate of administration. If heart failure is present, the drop rate should be reduced by increasing the concentration (e.g. three ampoules at the rate of 20 drops per minute rather than one ampoule at 60 drops per minute).

The best guide to dosage is the observation of the effect on the patient and, more particularly, on the blood pressure. The urinary output reflects the response of the kidney to shock and is a great aid in determining the severity of the shock as well as in evaluating therapy and prognosis. In most patients, one ampoule of levarterenol usually suffices, but in the more severe cases the concentration must be increased four-fold or more before an adequate rise in blood pressure is obtained. It should not take more than 20 to 30 minutes to reach this concentration (which, if required, makes the prognosis worse). However, as in the cases reported by the author,[2] one may give as much as six or seven ampoules per 1000 c.c. and still get recovery. When it is stated that the blood pressure could not be raised and the patient died in spite of levarterenol therapy, one should question whether the concentration had been increased properly and adequately. "Levarterenol therapy" is not enough. It must be "adequate levarterenol therapy".

The rate of infusion is gradually reduced (and administration eventually stopped) over a variable period, depending on how successfully the blood pressure is maintained without the drug. Although one to six days is the average length of time for therapy, some of our patients required two to three weeks of therapy. Instead of stopping the intravenous drip abruptly as soon as the blood pressure is maintained without levarterenol, one should administer immediately an infusion of 1000 c.c. of 5% dextrose in distilled water for a further period of 12 to 24 hours. Thus, if the pressure drops again (which it commonly does), levarterenol can again be administered without delay.

Interstitial escape of levarterenol, which is very painful and may cause necrosis of tissue—a reflection of its extreme potency as a vasoconstrictor agent—should be constantly watched for. Some patients tend to develop thrombosis in the infused vein and perivenous reactions and necrosis. This may usually be prevented if 20 mg. (2000 units) of heparin is added to the 1000 c.c. of infusion fluid.[13] Local tissue sloughs sometimes result from infiltration when the intravenous drip is being started. Accordingly, the bottle containing levarterenol should preferably be attached only after free flow has first been established with a 5% solution of dextrose in water. (From the onset of therapy it is advisable to use a Y-tube and two bottles to facilitate changes in concentration without any delay or interference with the drip.) Should extravasation occur, the infusion should be changed to another vein at once. The best therapy is immediate subcutaneous injection with a hypo needle into the involved ischæmic area of 10 to 15 c.c. saline solution with 5 mg. of phentolamine hydrochloride (Regitine).[14] I find it advisable to order this when levarterenol is begun, so that it can be given if necessary without delay, since if injected within two to four hours it will prevent tissue necrosis, which might otherwise be very extensive within 48 hours or sooner.[15] The saline dilutes the levarterenol while the phentolamine presumably blocks its action on adrenergic effector cells, preventing necrosis by decreasing the marked vasoconstrictor effect of levarterenol. The addition of a few c.c. of 2% xylocaine will relieve the great amount of pain usually present.[2] Some authorities add 300 units of hyaluronidase to the solution.[14] At the American Heart Association meeting in Philadelphia just a few months ago (October 1959) Zucker *et al.*, reporting their observations on 68 patients in shock, claimed that 5 mg. of phentolamine added to the levarterenol flask does not impair its hypertensive effect but is sufficient to prevent necrosis in areas of extravasation. This, if confirmed, will make levarterenol therapy much simpler and safer and there will be less need for a cut-down. At the present time, to try to avoid interstitial escape, the intravenous needle should be well advanced into the vein and securely fixed. In all cases in which several days of therapy are contemplated, it is advisable to cut down on the vein and insert a small polyethylene tube for a distance of six to eight inches into the vein. In several of our patients in whom all the peripheral veins were no longer suitable or had collapsed, our surgical confrere was called in to cut down on the femoral vein. It should be emphasized that the latter procedure, although it can be performed easily at the bedside, requires special training and should be carried out by a qualified surgeon. In this way therapy can be continued and the patient given renewed hope.

SPECIAL SUPERVISION

When patients are receiving levarterenol therapy special nurses should be constantly present, since blood-pressure readings should be made every few minutes at first and then every 10 to 20 minutes for as long as such treatment is given. The doctor should explain to the nurses in detail the mechanism and specific purpose of this therapy because, as time goes on, they will be increasing or decreasing the concentration, depending on the response of the blood pressure. If the nurse informs you that the blood pressure is under 100 systolic and you learn that she is not increasing the drop rate or concentration, you know that she was not properly instructed.

There is no reason for withholding this life-saving drug, provided the patient is in hospital and can be watched carefully throughout the whole course of therapy. If special nurses are not immediately available, arrangements can usually be

made for the floor nurse or intern to sit with the patient until the special nurse arrives.

Another need for constant observation is the danger of levarterenol's leaking into the interstitial tissues—a complication which should be treated as previously described, without delay.

RESULTS AND COMMENTS

The usual response is exemplified in the series of Miller *et al.*[5] Of nine patients with shock accompanying acute myocardial infarction, five ultimately survived. Without levarterenol, no more than two would have recovered. Sampson[7] had 20 recoveries in 30 cases. In Kurland and Malach's[3] series of 14 patients there were only four survivals, in spite of the fact that there was a temporary satisfactory pressor response in 12 of 17 courses of treatment. It is noted that in this series the concentration of levarterenol was not increased beyond one ampoule per 1000 c.c. of infusion (4 micrograms per c.c.). Griffith *et al.*[6] controlled shock in 17 out of 30 patients, using two ampoules of levarterenol per 1000 c.c. In a recent excellent review from the Michael Reese Hospital, Chicago, of 55 patients with severe shock after myocardial infarction treated with levarterenol, there was a mortality of 49%, representing a marked improvement over the known grave prognosis of cardiogenic shock not treated with vasopressor drugs. The duration of shock, as expected, influenced the results of treatment. Of 10 patients in whom the shock was known to have been present for four hours or longer when treatment was begun, only three recovered, while 10 of 17 patients treated when the shock was present for less than one hour survived. They also confirmed the fact that the amount of levarterenol administered per unit of time is of prognostic significance, although the actual concentrations used were not given.

We reported[2] the remarkable recovery of a woman 62 years of age who presented on June 4, 1955, with extensive acute myocardial infarction, secondary shock and congestive heart failure. Levarterenol was given for three weeks and had to be increased to a concentration of seven ampoules per 1000 c.c. (56 micrograms of levarterenol bitartrate). This case was quoted[16] as almost twice the highest concentration (with recovery) previously reported in the literature. We must admit that in about half a dozen patients given high concentrations (such as six ampoules per 1000 c.c.) there was no effect; in such cases, when autopsies were obtained, extensive infarctions were found.[17] One of our patients suffering from heart failure and shock secondary to a cardiac infarction, had an excellent blood pressure response with six ampoules of levarterenol per 1000 c.c.; however, one day later he succumbed. Post-mortem examination showed pulmonary congestion as well as extensive acute cardiac infarction. This further emphasizes the fact that the patients in whom increased dosage of levarterenol is necessary are those in whom cardiac damage is greatest and heart failure more likely to develop. Thus, one should not hesitate to continue increasing the concentration of levarterenol in order to obtain the necessary effect with the smallest amount of fluid.

Our experience with all other vasopressor agents including metaraminol and mephentermine sulphate has been far less effective, and this seems to be in accord with findings elsewhere. In several such cases the subsequent institution of the levarterenol drip resulted in the prompt reversal of what had appeared to be "irreversible shock".

There has been very little damaging evidence against the use of levarterenol. There have been a very few instances[18] of unexplained autopsy findings, particularly focal myocarditis and hæmorrhagic lesions of the pericardium and endocardium in some patients treated with levarterenol as well as with other vasopressor agents. Considering the large numbers given the drug, this complication is comparatively rare and these patients would probably have died without this therapy in any case. Also the many patients who have recovered are living proof of its great value.

SUMMARY

Levarterenol therapy may be life-saving in acute myocardial infarction with secondary hypotension. If there are no actual signs of shock but the systolic blood pressure remains under 80 to 85 mm. Hg (or under 90 to 95 mm. in a known hypertensive) for one to three hours in spite of relief of pain and administration of oxygen, levarterenol therapy should be started without waiting for shock to occur. If clinical signs of shock are present that do not immediately respond to analgesia and oxygen, levarterenol should be given without further delay. The systolic pressure should be maintained above 100 mm. Hg (120 mm. if the patient has been hypertensive). If this desired response is not instantaneous, the concentration of levarterenol should be increased, but the infusion should not be given at a rate of more than 60 drops per minute. Although the prognosis is worse if a concentration of more than four ampoules per 1000 c.c. is necessary, there may be recovery after as many as seven ampoules per 1000 c.c. and after treatment for as long as three weeks. If heart failure is present, digitalis should be given, and the volume of levarterenol reduced by increasing its concentration.

There are no contraindications to the use of levarterenol except inadequate supervision. Nurses should be carefully instructed. Complications are minimal, considering the serious nature of the cardiac condition. Interstitial escape of levarterenol should be detected at once and measures taken to prevent necrosis and pain. If administration is to be continued for several days, a venous cut-down should be performed and a polyethylene tube inserted. A femoral vein cut-down may be life-saving when peripheral veins are unobtainable. The dosage of levarterenol should be reduced gradually as the blood pressure improves. When the time comes to discontinue this medication, intravenous infusion should be continued with dextrose solution for another day until it is established that readministration of levarterenol will not be necessary.

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RÉSUMÉ

Dans les cas d'infarctus aigus du myocarde avec hypotension secondaire le lévartérénol peut quelquefois sauver la vie du malade. Si même en l'absence de signe de choc la tension systolique demeure en dessous de 80 à 85 mm. de mercure (ou en dessous de 90 à 95 chez un hypertendu) pendant une à trois heures malgré le soulagement de la douleur et l'administration d'oxygène, on doit commencer l'administration de lévartérénol sans attendre que le choc s'installe. Si d'autre part il existe des signes cliniques de choc qui ne disparaissent pas immédiatement avec l'administration d'analgésiques et d'oxygène, on doit aussi commencer sans délai l'administration de lévartérénol. On doit chercher à conserver une tension d'environ 100 mm. de mercure (120 chez un hypertendu) et si ce résultat n'est pas obtenu instantanément la concentration du médicament doit être augmentée sans toutefois dépasser le taux de 60 gouttes à la minute. Le pronostic s'assombrit si l'on doit faire usage de plus de quatre ampoules au litre bien qu'on ait déjà observé une guérison après trois semaines de traitement au cours duquel on a dû recourir quelquefois à sept ampoules au litre. Dans les cas de défaillance cardiaque on doit administer de la digitale et réduire le volume de lévartérénol en augmentant sa concentration. On ne connaît pas de contre-indication à son usage si ce n'est le manque de surveillance. Les infirmières doivent être particulièrement attentives à son administration. Si on les compare à la gravité des lésions cardiaques, les complications de cette thérapie sont minimes. La plus importante est la nécrose des tissus qui suit son extravasation et qu'on peut éviter en s'assurant du bon fonctionnement de l'injection intraveineuse. Lorsque les circonstances semblent exiger une administration prolongée il est préférable de pratiquer une dissection veineuse et d'introduire un cathéter de polyéthylène. La dose de lévartérénol doit être diminuée graduellement à mesure que la tension artérielle s'améliore.

SURGICAL TREATMENT OF PARKINSONISM: THE USE OF A PNEUMOTAXIC GUIDE WITH RECORDING AND STIMULATION*

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BEFORE summarizing our experience of the past six years in the surgery of parkinsonism, certain cardinal features of the technique used should be mentioned: a more detailed description has already been published. A fine blunt-wire leucotome, which opens 6 mm. from the centre of the shaft, has been used to create the surgical lesions. This method of producing a well-circumscribed and radiologically visible section has been retained because of its safety under specific conditions and also because it makes it possible to orientate the initial lesion in a given direction.

Accurate measurements to localize the optimum site of destruction are obtained directly from an x-ray film. A so-called pneumotaxic guide allows the operator to centre and fix the patient's head securely and, afterwards, to move it precisely in the desired direction. This brings the region to be studied in line with the central x-ray beam, about which, image enlargment by diverging rays is practically negligible.

One corrects for individual variations after obtaining the results of recording and stimulation with a triple-lead needle-electrode. It was found empirically that, in most patients, the lesion which causes the most pronounced hypotonia and, consequently, the best results for akinesia, rigidity and especially tremor, is centred at 15 mm. from the midline, 10 mm. below and behind the centre of the foramen of Munro. This is the point where the middle contact of the needle-electrode is first placed. In most cases, beta and theta rhythms from basal ganglia cells will be seen on the electroencephalographic tracing about that lead. Low voltage stimulation of motor fibres to the contralateral face from the lowest lead is an even more reliable procedure. If stimulation is not obtained, the needle-electrode is moved another 3 mm. posteriorly, and a response in the contralateral leg calls for anterior displacement of the electrode.

Most of the 100 patients reviewed have been operated on in this fashion. Although there has been no fatality since this method was perfected, its accuracy has been verified with a target as well as by repeating the procedure on cadavers.

RESULTS

It must be remembered that, so far, surgical treatment is applicable only for certain motor phenomena: tremor, rigidity, akinesia. A precise assessment of results is complicated by the extreme variability of these manifestations and of weakness and atrophy from patient to patient (even akinesia

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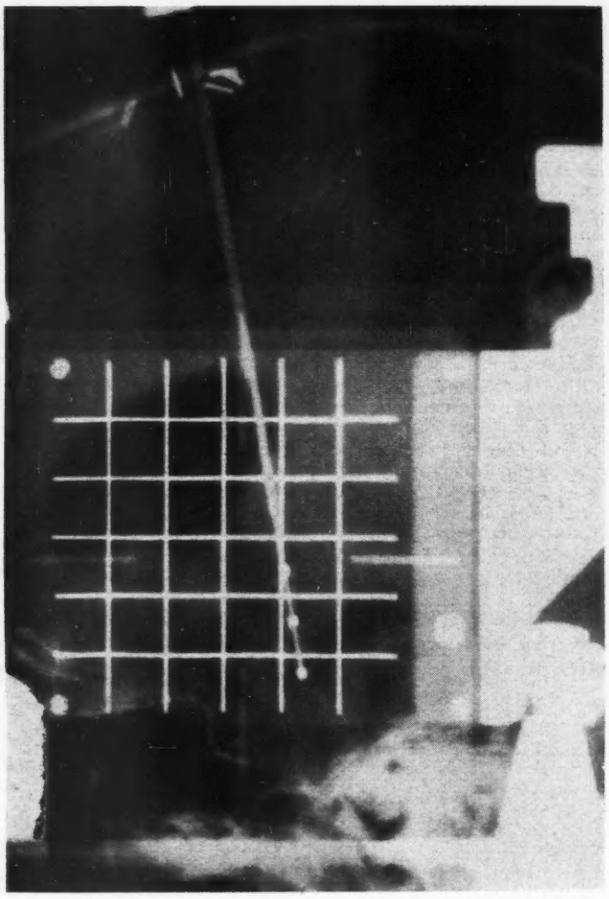

Fig. 1.—Photograph of x-ray film showing triple-lead needle-electrode in place for stimulation during a procedure. In the desired position, low voltage motor face stimulation is obtained from the lowest contact on the electrode but not from the second one.

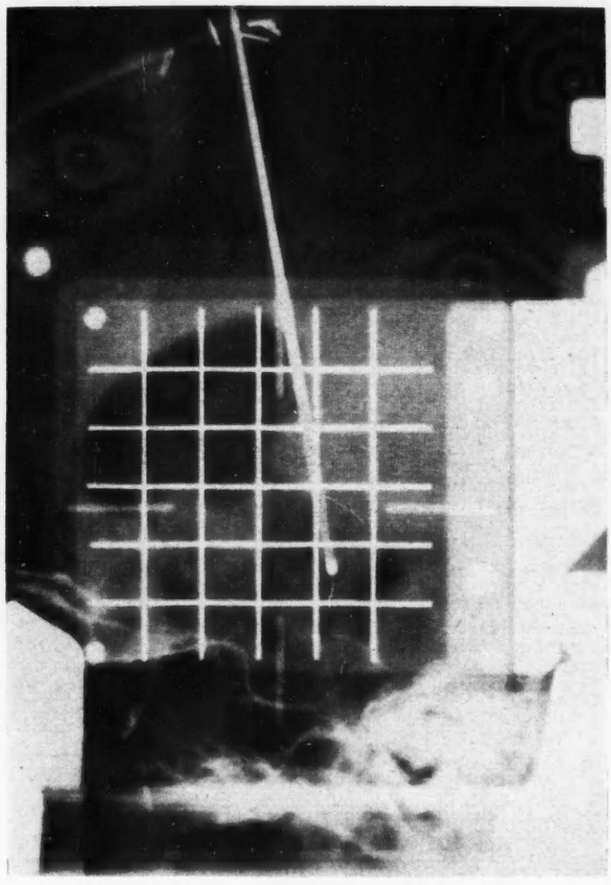

Fig. 2.—Photograph of x-ray showing leucotome in place of needle-electrode. Section is centred about the second contact above and in front of the point for motor face stimulation.

may vary independently from rigidity), and by the lack of satisfactory quantitative measurements. A detailed analysis will not be attempted in this cursory review of our cases. However, certain changes are striking enough to be evident to the patient, the operator and the referring physician; for instance, complete or almost complete cessation of tremor and recovery of the ability to accomplish fine or rapidly alternating movements. As stated in a previous paper, a patient is considered to be definitely improved when he graduates from one state to another, from bed-ridden to ambulatory, from ambulatory to self-sufficient, or from merely self sufficient to working. Unquestionable improvement was obtained in better than 80% of these cases with localized lesions of sufficient size (1 cm.), though limited and well circumscribed. In 15% of them, there was a definite improvement but of more doubtful value. In less than 5% the change produced was not readily evident. Among those who have been back at work for more than two years there are a few patients performing skilled occupations such as drawing plans, painting or playing the piano.

When sections were centred more anteriorly, it seemed that rigidity responded better to surgery than tremor. However, with the present postero-inferior lesions, tremor is treated quite as successfully as rigidity. Pure akinesia, although definitely improved, does not seem to be relieved as completely. Improvement in speech—that is, improvement in the tone and volume of the spoken voice—frequently follows these procedures although it cannot be depended upon to occur. Occasionally, contralateral oculogyric crises diminish in frequency and severity postoperatively, possibly because the fronto-pontine fibres have been involved in the procedure.

Transitory choreiform movements were definitely seen in four cases in which the lesion appeared to be 1 to 2 mm. lower than usual. In such cases the relief of tremor is particularly dramatic. A pronounced hypotonia persists, and the final result is very satisfactory. These effects are attributed to involvement of the adjoining corpus Luysii.

Besides contributing to accurate localization, stimulating the corticospinal tract practically eliminates the possibility of functional involvement of the motor fibres. No hemiplegia or even any appreciable hemiparesis was ever produced when using this technique. Such a safeguard is essential when dealing with patients who, in many cases, are already unable to take care of themselves.

The sharp drop in prothrombin time during the immediate 48 hours after operation is easily prevented with vitamin K, as we have already reported. Since the time of its use, there has been no clinical

or radiological evidence of postoperative bleeding, either local or systemic.

In this group, only 10% of the cases were submitted to bilateral procedures, for reasons outlined below.

Duration of results is still a moot subject. It probably varies a great deal according to the efficacy of the operation performed. It also appears to be related to the rapidity with which the disease progressed before operation. One must not be unduly alarmed by reports of recurrences. The improvement obtained lasts for many years; some of our earlier patients are still well. It is logical to believe that more precise and adequate surgical lesions will produce more durable effects.

INDICATIONS AND CONTRAINDICATIONS

Results are obviously dependent upon the selection of cases. Marked improvement could be expected in almost all cases if only young, mentally alert individuals presenting with unilateral, slowly progressive, mild to moderate forms of parkinsonism, with rigidity and/or tremor as the only presenting symptom, were selected for operation. However, it is felt that more is accomplished for a given patient and his family when the ability to walk, dress himself, and turn in bed are restored than when another less severely affected patient is returned to work.

Among the contraindications, mental alteration must be feared more than physical handicaps. Patients who show marked indifference or who are frequently confused are not desirable candidates for a procedure which may produce drowsiness and indifference for a few days after operation. On the physical side, cardiovascular, respiratory and urinary function should be adequate, as bronchopneumonia and oliguria might occur during the period of drowsiness. There should be at least a minimal amount of mobility of the joints on the side to be relieved by surgery. Age *per se* is not a contraindication, although, in older persons, section is usually performed in the minor hemisphere, since this results in less marked drowsiness than section in the major or dominant side.

Bilateral procedures are reserved for younger or mentally alert individuals. Adequate compensatory mechanisms seem to be necessary to withstand large or bilateral interruption of numerous pathways to and from the midbrain. For this reason, large or inaccurate lesions are fraught with danger. The size and proximity of the lesion to the midline seem to be more important in this respect than the degree of symmetry of the lesion on either side. A psychological and psychiatric study to assess these factors is now under progress.

Our present surgical lesions are situated more posteriorly and more inferiorly than those used at the beginning of the series. Lesions produced in cadavers demonstrate that they involve the posteroinferior globus along with part of the internal capsule immediately behind the genu and also the adjoining ventrolateral thalamus; they are above but close to the corpus Luysii. Comparison with earlier results leads us to believe that interruption of fibres between the globus and the midbrain and/or, even more probably, of fibres between the corpus Luysii and the globus, gives rise to postoperative hypotonia and the accompanying beneficial results.

SUMMARY

Most of the 100 cases of Parkinson's disease reviewed for this paper were operated on as follows: With the help of a so-called pneumotaxic guide, the centre of the foramen of Munro was brought in line with the central ray of a standard craniograph. Stimulation and recording were then carried out about a point situated 10 mm. below and behind the centre of the foramen of Munro at 15 mm. from the midline of the third ventricle. Finally, a section was made with a fine wire leucotome placed immediately above and in front of the point for low voltage motor-face stimulation.

Such surgical lesions have produced marked improvement in more than 80% of cases presenting with tremor, rigidity or akinesia. In less than 5% is the change obtained doubtful. Chief contraindications to the procedure are mental alterations or severe organic disease. Bilateral procedures should be used selectively and only in mentally alert patients. While surgery may not be the final answer to Parkinson's disease, patients are greatly helped by proper well-localized surgical lesions; harmful results from accurate section are minimal.

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RÉSUMÉ

La plupart des 100 parkinsoniens dont les cas sont rapportés dans cet article furent opérés à l'aide du guide pneumotaxique. Le centre du trou de Munro fut aligné avec le rayon central d'un craniographe ordinaire. On procéda ensuite à la stimulation avec enregistrement d'un point situé 10 mm. en dessous et en arrière du centre du trou de Munro et 15 mm. de la ligne médiane du troisième ventricule. On fit enfin une section au leucotome à fil de petit calibre immédiatement au-dessus et en avant de ce point pour stimulation à bas voltage de l'aire motrice de la face. Ces lésions ont causé une amélioration remarquable dans plus de 80 des cas présentant de la rigidité, du tremblement ou de l'akinésie. On n'obtint un changement douteux que dans moins de 5% des cas. Les principales contre-indications à ce procédé sont la détérioration mentale ou les maladies organiques graves. L'intervention bilatérale ne doit être employée que sélectivement et seulement chez les malades dont la cérébration est intacte. Même si la chirurgie ne représente pas la solution ultime au problème du parkinsonisme elle permet d'aider un grand nombre de malades grâce à la production de lésions bien localisées et dont le risque opératoire est minime.

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THE SYMPTOMLESS ABDOMINAL ANEURYSM—WHAT SHOULD BE DONE ABOUT IT?

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INTRODUCTION

IN A REVIEW of abdominal aneurysms treated in the Cardiovascular Unit of the Toronto General Hospital a plea is made by the author[1] for the surgical excision of symptomless abdominal aneurysms.

In this article an attempt will be made to give the reasons for advocating such a policy together with the results of operation on 20 patients.

The discovery of a symptomless abdominal aneurysm in a patient during the course of a routine medical examination is becoming increasingly common.

The reasons for this are probably threefold.

In the first place, the condition is one which develops in older patients and as the proportion of the population which reaches the advanced age group increases so will the number of aneurysms probably increase.

Secondly, physicians and surgeons are much more aware of the frequency with which such lesions, if looked for, are to be found.

Thirdly, whereas the discovery of an abdominal aneurysm a few years ago did little more than forbode an eventual disaster which nothing could circumvent, such is no longer the case.

What advice therefore should a doctor give when an abdominal aneurysm is discovered on routine physical examination of a patient?

Should nothing be said to the patient and a policy of "wait and watch" be adopted or should the patient be informed of the true state of affairs and advised that the aneurysm be removed surgically?

THE "WAIT AND WATCH" POLICY

Before the introduction of modern methods of excision of the abdominal aorta for aneurysms and aortic replacement by arterial grafting (for which much of the credit must go to DeBakey[2]), there was essentially no safe surgical method of treatment for an aortic aneurysm.

A doctor was therefore quite justified in saying nothing to the patient and waiting perhaps until symptoms of severe pain developed before considering a method of surgical treatment which was often of doubtful value and a formidable risk.

The main problem was probably the ethical one of withholding information from the patient and of deciding what to say to the relatives.

Today, the problem is quite different. It is a question of weighing up one calculated risk against another.

What then is the risk of *NOT* operating on a patient with a symptomless aneurysm?

The risk is that any abdominal aneurysm which can be diagnosed with relative certainty by abdominal palpation is probably fairly large and is liable to rupture at any moment without warning.

The results of treatment of ruptured abdominal aneurysms (whether intraperitoneal or extraperitoneal) in the Cardiovascular Unit at the Toronto General Hospital are as follows:

RUPTURED ABDOMINAL ANEURYSM

Number excised	21
Deaths	15
Survivors	6

One-third of those patients whose aneurysm ruptured had no symptoms prior to the catastrophic event.

If therefore we advise against operation for patients with a large or moderately large abdominal aneurysm, we accept the risk that they have probably one chance in three of rupturing at any moment without warning, and have about one chance in four of surviving such a complication if they can be transported in time to a hospital where such emergencies can be adequately handled.

On the other hand, it is not denied that many physicians can probably recall individual patients with a large abdominal aneurysm who have lived normal and pain-free lives for many years. The same is occasionally true of patients with an untreated carcinoma.

SURGICAL EXCISION

For the past three years the author has advocated a policy of surgical excision for symptomless abdominal aneurysm. The results to date are as follows:

SYMPTOMLESS ABDOMINAL ANEURYSM

Number excised	20
Operative deaths	nil
Postoperative deaths (to date)	nil

The fortunate results so far obtained should not, of course, lull one into a sense of false security or relegate the operation of aortic resection to that of a safe minor surgical procedure. There is no reason to suppose, however, that the good results of operation cannot be maintained in the future.

Furthermore, although the patients operated upon have been selected to some degree, the selection has been on common-sense grounds and operation has been refused only in the presence of

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some major and usually very obvious contraindication.

Of the 20 patients operated upon, one developed claudication of his left calf six months after surgery with probable complete or partial blockage of the left limb of his aortic graft. His symptoms are sufficiently mild that re-exploration would not be justified at the moment but may be necessary in the future.

SELECTION OF PATIENTS FOR OPERATION

Patients have been accepted for the operation of resection of a symptomless abdominal aneurysm if the following criteria were fulfilled.

1. *Age*

A patient of 85 years with a symptomless abdominal aneurysm is a subject for congratulations—not operation! The ideal age group for surgery is probably under 70 years of age. Our oldest patient was 75.

2. *Cardiovascular Status*

Here again a common-sense attitude must be adopted. Patients with a history of two or more coronary thromboses, or with angina or marked dyspnœa on exertion, are obviously not candidates for the type of operation under discussion.

3. *Renal Function*

The patient must have evidence of adequate renal function. Patients with only one functioning kidney should not be accepted.

4. *General Physical and Mental State*

Apart from the more specific criteria already mentioned, there remain the patient's general attitude to life, his normal degrees of activity, his motivation in wanting to live and to remain active and in good health.

Certain types of individual are not mentally equipped to face up to the knowledge that they harbour what may be a serious and lethal condition which can only be put right by a major operation. It is the job of the family physician to recognize such individuals and in such cases it would probably be best to postpone surgical advice even though the risks of postponement be recognized.

5. *Size of the Aneurysm*

It is true that the larger the abdominal aneurysm, the more dangerous it is. Is it safe therefore to leave a small symptomless aneurysm alone?

This immediately raises the question as to how big the aneurysm should be before it should be operated upon. Probably the simplest answer to this is that the abdominal aneurysm which can be detected clinically with reasonable certainty has probably reached a size which makes its removal advisable.

The mistake most likely to be made is in diagnosing an abdominal aneurysm in a thin person when it does not exist and missing quite a large one in a fat person because you cannot easily determine its presence. In either case however, further investigation, possibly including aortography, will provide the answer.

LONG-TERM RESULTS

Although the maximum follow-up time in this series of aortic resection for symptomless abdominal aneurysm was only three years, we know that patients with symptoms from an aneurysm who have had the operation have done very well over the five-year period since we started to perform this operation in Toronto. Their aortic grafts have remained patent and have functioned well. There is no reason to suspect that those operated upon at an earlier stage in their disease will not have just as good a long-term prognosis, if not a better.

SUMMARY

The dangers of a symptomless abdominal aneurysm are recorded, and the relative safety of resection of such aneurysms is noted. A plea is made therefore for the surgical removal of symptomless abdominal aneurysms in suitably selected cases.

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RÉSUMÉ

La découverte fortuite d'un anévrisme abdominal silencieux devient de plus en plus fréquente probablement à cause du nombre croissant de malades âgés, d'une plus grande connaissance de cette lésion de la part des médecins et des chirurgiens et enfin des possibilités thérapeutiques qu'offre maintenant la chirurgie à ces malades. Quelle est la conduite à suivre dans ces circonstances? On pouvait jadis se permettre de constater le fait sans en informer le malade puisque la lésion était incurable mais de nos jours le problème consiste à évaluer deux risque et à choisir le moindre: à savoir, celui de laisser évoluer la lésion sans y toucher et celui d'intervenir par excision. La première solution comporte un risque de 33% de rupture sans signe prémonitoire et cette complication elle-même comporte 75% de mortalité. Pour ce qui est de la seconde solution, une revue de 20 malades opérés à l'Hôpital Général de Toronto montre qu'il n'y eut aucune mortalité opératoire ou postopératoire (à date). L'auteur se hâte d'ajouter qu'il ne faut pas se laisser leurrer par ces résultats mais avec une technique bien à point et des malades judicieusement choisis l'intervention n'en présente pas moins beaucoup d'intérêt thérapeutique. Parmi les critères qui doivent présider au choix des malades l'auteur suggère que la limite d'âge maximum soit établie à 70 ans; que, la lésion mise à part, l'état cardio-vasculaire du malade soit satisfaisant; que ses deux reins fonctionnent bien et que l'état général et l'attitude mentale soient encourageants. Les dimensions de l'anévrisme entrent aussi en ligne de compte. Il semble que tout anévrisme que l'on peut palper à travers la paroi abdominale soit assez gros pour être dangereux et mériter résection.

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Case Reports

OSTEOBLASTIC OSTEOGENIC SARCOMA

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HAVING REPORTED in 1953 a treated case of osteolytic osteogenic sarcoma of the upper end of the humerus,[1] we felt that it might be interesting to report a case of untreated osteoblastic sarcoma. The patient with the lytic sarcoma reported in 1953 was treated by interscapulo-thoracic amputation. Three months later his lungs were peppered with discrete bony metastases, and he died in a short while. The case of an osteoblastic lesion now to be reported holds interest for three reasons: (1) It was virtually untreated. (2) Its behaviour was remarkable—it was extremely malignant locally and a parasite on the nutrition of the host. (3) Its size became enormous—measuring approximately 60 inches in circumference and weighing approximately 55-65 lb., approaching if not surpassing the weight of the host near death.

There are numerous classifications of bone tumours, many of them ponderous and confusing, but I believe it in order to give a brief clinical classification with the prognosis and distribution in order to understand better the category of the case at hand. Their classification with regard to malignancy is as follows:[2] (1) Osteosarcoma—almost uniformly fatal. (2) Fibrosarcoma—distinctly less malignant. (3) Chondrosarcoma—this occupies a mid position in malignancy between the previous two.

Osteosarcoma can be further classified into: (1) osteoblastic or sclerosing sarcoma; (2) osteolytic sarcoma; (3) chondroblastic sarcoma; (4) primary chondromyxosarcoma.

The prognosis of osteogenic sarcoma of bone is not good, and particularly is that true of the osteolytic type, especially when located in the upper humerus or femur. From a series of 205 cases Prevo[3] reports that there were no survivals at five years when the tumour was located in the proximal end of the femur. Geschickter and Copeland[4] state that in their series there was no case of cure of osteolytic sarcoma in the upper humerus or femur; all cured cases were of the osteoblastic type and cure was effected by radical operation. If complete resection is possible, the chances of cure are over 25% when primary radical operation is performed in the osteoblastic type. These authors[5] stress that delay of operation or a long interval between biopsy and definitive treatment gives less chance of survival. However, Ferguson believes that one should wait until signs of lessened activity of bone destruction are apparent before operating, especially if the lesion is in the proximal femur or humerus. He also believes that since the increase of early amputation the survival rate has dropped. This observation was made from a series of 400 cases.

The case to be presented here was that of a well-developed young French girl who had been seeking aid for about three months because of pain in the right leg, chiefly about the knee. As she entered the office it was noted that she walked with a slight limp. There was no history of injury, but she stated that she had gradually increasing pain, worse at night, in her right knee.

On examination, she was apparently healthy and of good colour and nutrition. The general physical examination was entirely negative, including that of the right knee. However, upon manipulation of the right hip joint it was noted that she had marked limitation of both internal and external rotation and some limitation of flexion.

In August 1958, she was admitted to St. Joseph's Hospital, where radiographs of the right hip showed a peculiar lesion in the greater trochanter area, suggestive of either chronic osteomyelitis, tuberculosis or possible bone tumour. Further spot films of this area revealed a rather suggestive sunburst appearance, and a tentative diagnosis of osteogenic sarcoma of the upper end of the femur in the region of the greater trochanter and neck was made. Radiographs of her chest and right knee were negative. She was afebrile, the tuberculin test was negative, and all relevant hæmatological investigations were within normal limits. Shortly after this she was operated upon, and the lesion exposed. The tissue adjacent to the bone was œdematous, the cortex was thin and immediately under the cortex was a soft gelatinous avascular disorganized substance. A bone block was removed and a specimen was sent to each of three pathologists. The separate pathology reports came back as definitely positive for osteogenic sarcoma. The parents of the girl were contacted and the extreme seriousness of the lesion was pointed out. We offered, perhaps without much enthusiasm, the mutilating procedure of hemipelvectomy. The risks involved and the prospect of cure were somewhat dampened because at that time we did not know whether the lesion was lytic or blastic, and thought perhaps that it was more likely to be lytic than blastic. The grim picture painted and the mutilating procedure offered perhaps did not appeal to the girl's parents, and they disappeared to the care of a faith healer in a far away city, who apparently had much more that was desirable to offer.

I did not see the girl again for one full year, and this time she had been admitted to my service at the Sudbury General Hospital during my absence. I was amazed in the first instance to see that she was still living, and in the second, that she now possessed an enormous mass in the right femur. It was globular, extending to the perineum and up over the ilium; a small atrophic knee and lower limb stuck out of the inferior end of the mass like a distorted drum stick. The mass was hard, hot and tender, and huge veins coursed superficially underneath atrophic, shiny œdematous skin. Another striking feature that could not fail to impress one was that this thin, pale emaciated girl was quiet and comfortable in regard to her cardiopulmonary and abdominal systems. Apparently this

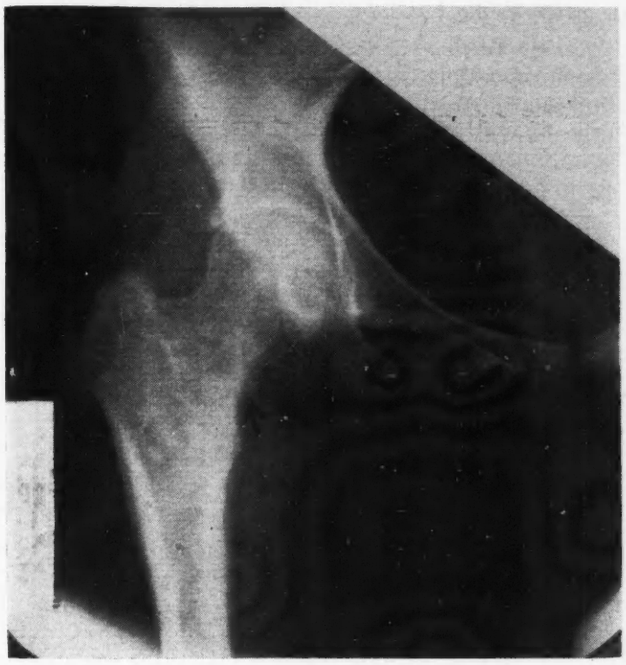

Fig. 1.—A.P. radiograph showing early destructive tumour in basal neck area.

huge active mass, although dreadfully malignant, was still localized. Protruding from the area of previous biopsy, there was a hard, irregular, lobulated mass, the size of a grapefruit, with some areas of necrosis and infection, and possessing a very foul odour. The fingers and toes showed clubbing, possibly indicating a combination of an arterio-venous shunt, plus sepsis. Radiographic examinations of the lungs and abdomen were negative for metastatic lesions.

Even at this late stage the behaviour of this tumour suggested the possibility of radical resection in this poor-risk patient, and accordingly transfusions were given in an attempt to restore her nutrition. After transfusion the tumour was noted to increase in size, colour and tenderness, and it became hot. The girl's condition did not respond, but she complained bitterly during and after transfusions. This was a truly parasitic mass, thriving upon nutrition directed at the host.

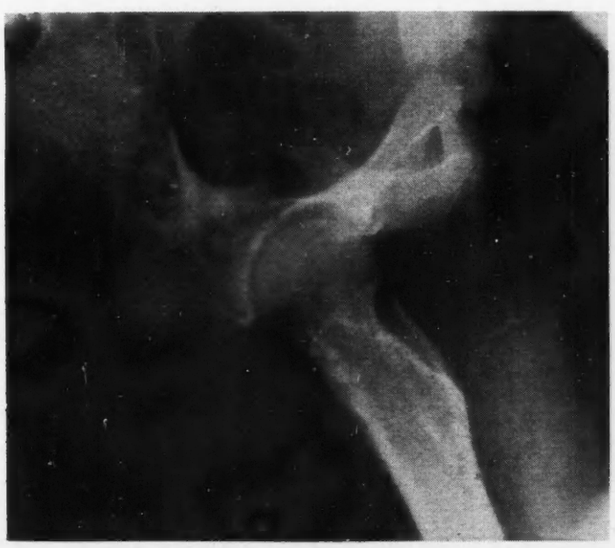

Fig. 2.—Lateral view of the region showing early sunburst.

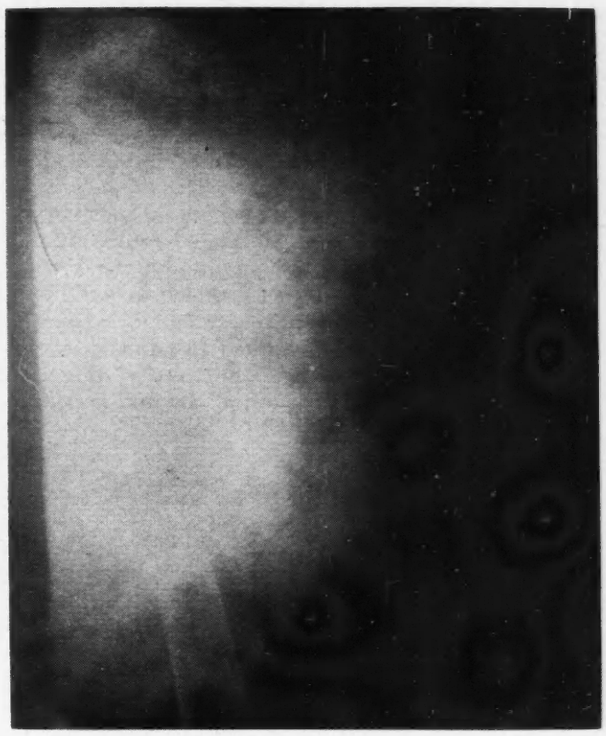

Fig. 3.—Shows destruction of the shaft and great osteoblastic activity one year later.

In spite of adequate surgical consultation, stating that the calculated risk was reasonable, the anæsthetists felt that she was too great a risk, and chose to leave her to a certain fate.

At this stage, all therapy was discontinued, and she was given up to one-half grain morphine every two to four hours as required, as severe continuous pain was her only major disability, other than the fact that this massive tumour rendered her immobile and controlled her existence and undermined her nutrition. The girl slowly became more anæmic, weak and emaciated, until the size and mass of the tumour approximated or exceeded that of herself before death. Death was hastened by one fairly massive hæmorrhage from one of the huge thin-walled veins coursing over the tumour two weeks before the end. Death came from

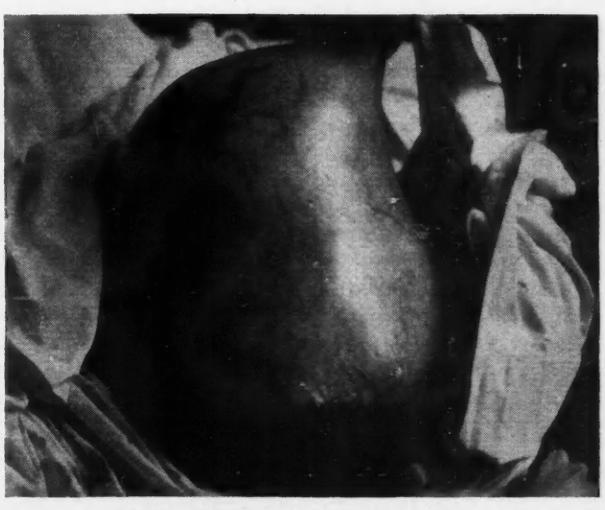

Fig. 4.—Photograph showing massive size and large engorged veins.

purely local destruction, competition for nutrition, and sepsis fully 15 months after the diagosis had been made, and possibly some 20-21 months since the start of the lesion.

POST-MORTEM FINDINGS

(a) *External Examination*

The body was that of an emaciated young girl. The whole right upper leg and thigh was enormously swollen, forming an oval mass down to within one inch of the knee. The tumour measured 20" in diameter and 60" in circumference, and had an estimated weight of 55 to 65 lb. Posteriorly and laterally, there was gross ulceration and necrosis of the skin and underlying tumour.

(b) *Internal Examination*

Pleuræ.—These were free of adhesions but the visceral pleuræ over the lower lobes and the left upper lobe showed a lobulated or cobblestone pattern.

Lungs.—The lungs beneath the lobulated areas of pleuræ felt nodular and the cut surface here had indistinct greyish to whitish areas with some surrounding consolidation. Grossly, it was not possible to know whether these represented tumour deposits together with pneumonia or bronchopneumonia. These areas involved an extensive part of the left upper and lower lobes, especially in the peripheral axillary and lateral aspects. In the right lung they were seen only in the lateral aspect of the lower lobe, and here involved an area of some 2" x 1" x ¼".

Heart.—The heart was somewhat globular in shape. A very large defect was present in the inter-auricular septum. It measured 2 cm. in diameter and was perfectly round. It was not present in the usual place, that is, the foramen ovale, but immediately below this and above the membranous part of the interventricular septum.

Gastro-intestinal tract.—Normal.

Liver.—Normal.

Biliary tract and pancreas.—Normal.

Spleen.—This was normal in size. The cut surface in some areas contained small, distinctly yellow areas of irregular outline, measuring at most 2 x 3 mm. These appeared to be of firm consistency.

Adrenal glands.—Normal.

Kidneys, ureter, and bladder.—Normal.

Tumour.—This was not opened from the outside because of the difficulty of reconstituting the skin. It was examined from the medial aspect through the lateral walls of the pelvis. A column of tumour was found to be growing around the femoral vein and had penetrated through the femoral ring. A second small mass of tumour, measuring approximately 2" x 1", had come through the obturator foramen and was bulging into the lateral wall of the pelvis. The tissues of the wall were soft and œdematous and almost myxomatous, so that it was not possible to decide whether they represented altered tissues of the pelvis or a myxomatous portion of tumour. The tumour, cut into through the femoral ring, was found to vary in consistency. Many bony and calcified areas were scattered throughout white tumour tissue while other areas were of a myxoid nature.

Microscopic Findings

Lung.—Sections of four blocks of the peculiar bronchopneumonic areas were of typical severe acute bronchopneumonia. Also, a nest of necrotic tumour cells in one area, and occasional well-preserved isolated tumour cells in capillaries and septal walls, were seen. No obvious or viable metastatic mass was found.

Tumour.—Composed predominantly of spindle-shaped cells, with many giant and multi-nucleated cells. Many of these, as well as the spindle cells, were in mitosis and abnormal mitotic figures were very common. Trabeculæ of abnormal osteoid tissue and bone were scattered throughout. In other areas, tumorous chondroblastic tissue was seen.

Liver.—Showed centrilobular chronic passive venous congestion.

Heart, kidneys and pancreas.—Unremarkable.

Spleen.—The small yellow areas were all bland infarcts.

Ovaries.—Appeared very inactive.

Adrenal gland.—Appeared neither active nor exhausted.

SUMMARY

A case of untreated osteoblastic osteogenic sarcoma of the upper end of the right femur in a 16-year-old girl has been presented. The total length of the survival period was approximately 18 months from the first complaints to death. The behavour of this tumour, its huge size and the absence of positively proved metastatic lesions are worthy of note.

I wish to thank Dr. M. J. Lynch, pathologist of the Sudbury General Hospital, for the autopsy report.

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PHENELZINE DIHYDROGEN SULPHATE INTOXICATION

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BETA PHENYLETHYLHYDRAZINE dihydrogen sulphate (Nardil), a powerful inhibitor of monoamine oxidase,[2] has been introduced as a treatment for depression. Various research studies have commented on its effectiveness in various types of depression.[3, 5, 7, 8] Woolley and Shaw[4] suggest that serotonin acts as a chemical mediator, whose func-

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tion it is to control the pulsating action of the cells which supply nerve tissue with nutrient materials and oxygen. The pulsation of the oligodendroglia is directly proportional to the amount of serotonin present. A monoamine oxidase inhibitor protects serotonin and allows its concentration to increase, thereby increasing the nutrient cell activity. The enzyme monoamine oxidase is found in several areas of the body, especially the nervous system and the liver. Phenelzine, it is believed, preferentially inhibits the enzyme in the brain. Side effects reported with this drug are dizziness, weakness, fatigue or tremulousness, drowsiness and indigestion; the development of hypomanic or manic reactions, and less frequently, insomnia, muscular stiffness, sexual impotence, hypotension, and constipation. Sainz[6] reports that mild accidental overdoses are characterized by the appearance after not less than 24 hours of drowsiness, followed by dizziness, irritability, fatigue, nausea and ankle œdema. In severe overdosages the initial manifestations are faintness, severe precordial pain, and intense headache; a certain amount of hyperactivity usually precedes the episode which develops with marked agitation. Later the skin becomes cool and clammy with profuse perspiration, and the pupils become small (but respond to light). In severe cases seizures resembling status epilepticus may occur. In other cases trismus and opisthotonos may be observed. The pulse tends to become irregular and fast, and respirations shallow. In all cases observed, however, the patient remained in intellectual contact throughout. Sainz[6] reports the recovery of patients who had taken up to 555 mg. in a 24-hour period. This paper is a report on a case of intoxication with phenelzine and the clinical picture that ensued.

A man, 31 years of age, with a long history of alcoholism and maladjustment, had been under psychiatric care off and on since 1957. The diagnosis was of chronic alcoholism in an inadequate personality. He had apparently been drinking quite heavily on the day of December 21. On his return home in the early hours of the morning, feeling tense and anxious (so he states), he took 25 tablets of phenelzine in an effort to obtain some sleep. His mother with whom he was staying became alarmed when on the following morning, December 22, she could not rouse her son. She got in touch with the psychiatric department through the family physician, giving a history that her son had taken 25 tablets of phenelzine, following which he was restless for a time, apparently was nauseated, vomited and then lapsed into a coma-like condition from which she was unable to rouse him.

The patient was admitted to the Psychiatric Department on December 22, 1959, at 10:30 a.m. On admission he had a pale facies, was walking with a shuffling gait and needed constant support. Pupils were widely dilated and he was unable to give an account of himself. He stated that his jaw was sore, and his speech was slow and mumbling. He added that he had taken 25 phenelzine (Nardil) tablets at about 1:00 a.m. as he was anxious and tense.

Physical Findings on Admission

The face was flushed and he was salivating fairly actively. Heart rate appeared normal; blood pressure 118/74 mm. Hg, pulse rate 108. Chest appeared normal. Nothing abnormal was found in the abdomen. The pupils were widely dilated—reacted to light. Fundi appeared normal. There was marked hyperflexia of the deep reflexes of the lower limbs with some spasticity; plantar reflexes normal. Abdominal reflexes were not obtained. His muscles appeared to be in spasm. The upper arm reflexes were also slightly exaggerated, but not as marked as in the lower limbs.

Psychiatric Examination

The patient was in slight contact with reality. He was able to recognize a nurse. His speech was vague and rambling and his concentration was extremely poor. He needed constant stimulation in order to elicit an answer. His speech was thick, rambling and at times incoherent. He was unable to give an adequate account of what happened. All that could be elicited from him was the fact that he had taken 25 phenelzine tablets. He was disorientated in time and place, but not for person. Throughout the examination he was extremely restless and was constantly moving his limbs around.

A diagnosis of toxic confusional state was made. Shortly after admission a gastric lavage was carried out and a small amount of a yellow mucous fluid was obtained. At 12 noon the picture was one of restlessness, with only slight response to stimuli. The patient had relapsed into a semi-comatose condition. He had a bilateral trismus and was hyperpnœic.

Laboratory Investigation on Admission

Hæmoglobin value was 11.1 g.; white blood cell count 9100, with neutrophils 79%, monocytes 4%, lymphocytes 15% and immature forms 2%. Sedimentation rate was 11 mm. in one hour.

Electrolyte values.—Sodium 142 mEq./l., potassium 4.6 mEq./l., chloride 639 mg. % (109.3 mEq./l.), CO_2 combining power 50 vol. %, 22 mEq./l., and blood urea 20 mg. %.

Liver Function Test Values

Alkaline phosphatase 3.8 units, total cholesterol 247 mg., total serum protein 7.3 g., albumin 5.1 g., globulin 2.2 g., A/G ratio 2.3, van den Bergh total 0.5 mg., direct 0.2 and indirect 0.3.

Glucose 5% in saline was administered intravenously. Throughout the day, the patient remained in a semi-comatose condition. At 4:30 p.m. an internist was called in and the following were his findings:

The patient was unconscious, although one had the impression that he would rouse slightly with maximal stimuli. He was flushed and hyperpnœic with a jerky type of respiration. He had a bilateral trismus with marked salivation and blowing through his clenched teeth. The pupils were widely dilated. The fundi seemed normal. The heart rate, blood pressure and lungs seemed normal. He was tossing around in bed and was kept there with some difficulty by an attendant. There was marked hyperflexia of the deep reflexes of his lower limbs where there was some spasticity, but the Babinski response was normal. Abdominal reflexes were not obtained. His muscles appeared to be somewhat in spasm. The upper arm reflexes were also

slightly exaggerated, but not nearly as much as the legs. It was felt that the patient's general condition was not desperate, although there was some cause for concern. It was decided that at this time he should be continued on supportive fluids. It was agreed that if the patient became more agitated, with increasing evidence of hyperirritability of his musculo-skeletal apparatus, reserpine should be used.

Throughout the day the patient's blood pressure, pulse rate and respirations were taken hourly without significant change noted. The patient micturated involuntarily on a number of occasions. When seen by the writer at 8:30 p.m. the clinical picture was the same as above except that he appeared to be more restless. At 8:45 p.m., 2.5 mg. of reserpine was given intramuscularly. At 10:00 p.m. it was possible to arouse the patient enough for him to take some fluid. He continued to be quite restless throughout the evening until 4:00 a.m. At that time the intravenous drip was discontinued and an improvement was noted in his condition. His pupils were less dilated. He was now reacting to stimuli and he was resting more quietly; trismus was less marked. When examined at 9:00 a.m. on December 23 it was noted that his trismus was markedly reduced. His reflexes had become normal and his breathing had eased. He was drowsy, but responsive to stimuli. At 11:00 a.m. the patient roused to take fluids. He was quite coherent and in good contact with reality. His trismus was now gone and his pupils were no longer dilated. He had a complete amnesia for events following the taking of the tablets. He still felt drowsy and slept until 7:00 p.m. When examined at 7:00 p.m. no abnormal signs were noted. The patient was able to get out of bed and join the other patients in the lounge. Other than a complaint of feeling dizzy and of a sore jaw, the patient stated that he felt fine.

LABORATORY INVESTIGATIONS (DEC. 23, 1959)

Liver Function Test Values

Alkaline phosphatase 4.8 units, protein total serum 6.7 g., albumin 4.9 g., globulin 1.8 g., A/G ratio 2.7, van den Bergh total 1.95 mg., direct 0.1 and indirect 1.85.

Electrolyte Values

Sodium 144.0 mEq./l., potassium 4.4 mEq./l., chloride 655.2 mg. % (112 mEq./l.), CO_2 combining power 66 (29 mEq./l.). White cell count was 8000.

Psychiatric evaluation on this date revealed no abnormal findings other than amnesia. One incident he did remember, however, was the gastric lavage.

Liver function tests were repeated on December 29, with the following results: alkaline phosphatase 3.8 units, cholesterol 182 mg., total serum protein 6.6 g., albumin 4.8 g., globulin 1.8 g., A/G ratio 2.6, van den Bergh total 1.0 mg., direct 0.1 and indirect 0.9.

DISCUSSION

Sainz[6] states that the symptomatology is caused by the enormous increase in catecholamines, principally adrenaline and noradrenaline, in the brain and blood stream as a result of monoamino-oxidase inhibition. It is essentially a hyperadrenalinæmia. This veritable catecholamine intoxication may resemble other conditions such as coronary occlusion, tetanus, meningitis or brain tumour. Differential diagnosis is afforded by the intramuscular injection of 40 mg. of triflupromazine. In case of intoxication with phenelzine (or any other hydrazine product) within 15-20 minutes the patient has shed most of his symptoms and appears to be resting comfortably. Treatment advised by Sainz[6] is the intramuscular administration of 20-40 mg. of triflupromazine (or any phenothiazine) from four times a day to every two or three hours. Phenothiazines antagonize the catecholamines. Measures to prevent dehydration and preserve electrolyte balance should be taken. Absolute bed rest and stimulants such as caffeine and analeptics should be avoided. The mode of action of this drug's antidepressant effect is still undetermined and may be due to increase in serotonin level in the brain. Numerous studies have shown that reserpine releases both serotonin and noradrenaline throughout the body, and therefore lowers the content of these amines in the brain and peripheral tissues.[1] Under these circumstances it was felt by the writer that the drug of choice in the treatment of phenelzine intoxication would be reserpine. In this case the intramuscular injection of 2.5 mg. of reserpine was found to improve symptoms within a short space of time. Electrolyte studies did not show any marked disturbance. However, liver function tests indicated that liver dysfunction occurred as a result of the intoxication, though this condition was found to be reversible. Other than an amnesia for the acute stage, no residual damage was noted. The clinical picture during the acute stage indicated a disorganization of cerebral function rather than the picture of exclusive depression or over-stimulation. The disturbance is widespread and involves cortex as well as deeper structures. It is possible that all his symptoms could be accounted for by high brain stem and hypothalamic dysfunction where the serotonin concentration of brain extracts is the highest.[9]

SUMMARY

A case of overdosage from 375 mg. of phenelzine is presented. The patient was confused, semi-comatose, flushed and hyperpnœic, and had dilated pupils, trismus, generalized muscular rigidity and hyperreflexia. The treatment of such cases is discussed.

I wish to acknowledge the help and co-operation of Dr. F. Heal, chief of medicine, Providence Hospital, Moose Jaw, and to thank Dr. D. W. Baxter, neurologist, University of Saskatoon, for his comments.

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Special Article

INSURANCE MEDICINE*

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DEFINITIONS

LIFE AND health insurance is a form of group social security by which people make provision for the inevitable economic stresses of life—i.e. disability, retirement and death.

Insurance medicine is the application of the science and art of medicine to the assessment of the life and health insurance risk. It is risk appraisal, prognosis, or the forecasting of the time of death and the liability to disability due to accident or disease.

HISTORY

From its beginnings in the latter part of the seventeenth century, life and health insurance has gradually developed at a speed influenced greatly by the development of medicine, with which it is so closely related. Originally only the supposedly healthy individuals were insured. Selection was by personal appearance before the board of directors of the company, one of whom was a physician—hence the persisting use of the title "medical director" for physicians engaged in this work. Since the turn of the present century, with the development of medicine and more accurate diagnosis and prognosis, the medically impaired individual also has been able to obtain insurance, subject to an extra premium. Of recent years, the better cases of even the grossly impaired, such as the diabetics and those recovered from coronary thrombosis, may often obtain insurance coverage.

A slightly more recent development (1912) is the application of life insurance to the group, i.e. group life insurance. To group life insurance was first added hospitalization and later medical care plans. The development of medical care plans, on both the group and individual basis, has been very rapid, especially since 1945. So extensive is this coverage now that it is estimated that probably more than one-third of the average doctor's income is derived from medical care plans provided both by physician-sponsored service plans and commercial carrier indemnity plans. In addition to this, insurance companies operating in Canada pay over $3,000,000 a year to physicians for the medical examinations and reports on life and health insurance applicants.

The size of the life insurance industry and the amount of money involved will be appreciated from the fact that Canadians purchased over 5.5 billion dollars' worth of life insurance in 1958, and with a total of 39 billions in force they own more life insurance in relationship to the gross national income than any other country in the world (Canada 14.5%, U.S.A. 12.6%).

*Sponsored by the Canadian Life Insurance Medical Officers Association.

PHYSICIANS' ROLE IN INSURANCE MEDICINE

A physician becomes involved in insurance medicine in one or several of the following capacities:

(a) As a practising physician—(i) The examination of applicants for life and health insurance—as an approved examiner for an insurance company, or as a practising specialist to examine problem cases. (ii) The provision of reports of professional attendances on patients of his who are applicants for insurance or claimants for disability benefits, i.e. "Attending Physician's Statement".

(b) As the medical director of an insurance company—full- or part-time—(i) Medical underwriting—i.e. the assessment of the life and disability insurance risks. (ii) The review of controversial claims, e.g. for partial or total disability or for benefits under various medical care plans. (iii) The provision of a health service for the insurance company's employees: pre-employment medical examinations, periodic medical examinations, health advice.

DIFFERENCE FROM CLINICAL MEDICINE

Insurance medicine differs from clinical medicine in that while the practice of clinical medicine has basically to do with (a) the preservation of health and prevention of disease, and (b) the treatment of disease, insurance medicine is mostly diagnosis and prognosis, or assessment or forecasting of the time of death and liability to and length of disability. This diagnosis and prognosis is based on the evidence that can be developed through the examination of the applicant for insurance, and the reports provided by his physician. The decision must be made at the time, and is final and legally binding. While most applicants for insurance usually do their best to recall their medical history, this is not always easy for the apparently well, and also there are a small number who may reveal as little as possible. There is also a tendency for claimants for disability benefits to exaggerate their disability or its length. The insurance medical examiner must by skillful and at times leading questions develop an accurate history, backed by a careful physical examination, as a basis for the assessment of the life and health insurance risk. The "Attending Physician's Statement" in life insurance serves to verify and amplify the history recorded in the examination form. In the case of accident and health insurance it must be an adequate basis on which to establish a just claim. Obviously there is a definite element of medical detective work in insurance medicine.

THE EXAMINATION FOR LIFE OR HEALTH INSURANCE

Insurance is usually sold, not bought, and the completion of a sale may rest on the ability to get the medical examination completed at short notice. However, while such service is very helpful, this factor is often over-emphasized by the representative, and a diplomatic secretary or examiner should be able to arrange the examination to suit the convenience of the examiner. The examination must take place in an environment adequate for a proper examination, i.e. preferably the physician's office or, failing this, at the applicant's home. A system

of examination conducive to speed and accuracy is important. Much misconception exists among the laity, and even among insurance representatives, as to the time required for a good insurance examination. This varies, of course, with the length of medical history and difficulty of the examination, but is seldom less than half an hour.

The basis on which the life and health risk is assessed is the information contained on the insurance examination form and the reports requested from physicians who have attended the applicant ("Attending Physician's Statement"). The fees for this examination and these statements are paid by the insuring company. The examination form presumes, as a prerequisite and basis for the granting of insurance, that the applicant will honestly and to the best of his ability furnish the insurer with all pertinent facts that may affect his insurability, withholding nothing. The form consists of two parts. The first part contains the medical history as given to, and elicited by, the examiner. The questions are framed so that in addition to revealing the conditions he has had, he is required to deny having had the conditions which would affect his insurability. At the bottom of this form the applicant signs a statement to the effect that he is the person involved, and that the history is full and correct, and forms a part of his contract. His signature is witnessed by the examiner and his history is photostated and becomes a part of his actual contract. The contract is contestable up to two years if failure to disclose a significant medical history is proved. It is therefore important to the applicant that all such medical history be revealed. The second portion consists of the physical examination. Full instructions for its completion are given on the form. It is of the utmost importance that the examiner should read these instructions and follow them exactly. The questions on the form have been evolved over a long period of time and in the light of vast experience. They are constantly under revision, with a view to simplification. You therefore may be assured that there is good reason for each and every instruction to the examiner and question to the applicant. Questions are usually grouped in systems requiring a "yes" or "no" answer, with the instruction – "If 'yes', underline the condition referred to and give full details." Failure to underline the condition is one of the commonest errors in completing the form and leaves the medical underwriter at a loss to know which of the several conditions is referred to. Details given should be brief, and must include date, diagnosis and length of illness, whether or not recovery was complete, and the names and addresses of the attending physicians and consultants. Without complete answers it is impossible to appraise the risk properly and it becomes necessary to write back for further information, with consequent delay, annoyance for all, and expense.

HEALTH INSURANCE

The major problems of insurance medicine are not those arising from life insurance, but those from health insurance. It is clearly the right of the individual to insure himself against the cost of hospitalization and medical care. This right, plus the twentieth century socio-economic trend for increasing security, has resulted in a very rapid growth of medical care plans, sponsored both by the profession and the insurance companies. It is estimated that over three-quarters of our population is now covered by hospitalization insurance, and over half by various medical care plans. This has necessitated the co-operation of the practising physician in the implementation of these plans. If we are to avoid the introduction of compulsory medical care plans with the government as the third party, then voluntary prepaid medical care plans must be available to all at a reasonable cost, must function efficiently and must satisfy the public who subscribe for them, the physician who provides the services, and the insurance carrier who administers the plan.

CLAIMS FORMS (HEALTH INURANCE)

To implement payment under these plans, proof of medical disability of the insured must be provided by the attending physician. It is the responsibility of the insured individual to produce the proof of his claim for medical disability, and to pay any fee for the completion of the claim forms which may be required. The usual procedure, in establishing proof of disability, is as follows: The employer (in the case of group insurance) or the insuring company (in the case of individual insurance) provides the claimant with a claim form and instructs him to have it completed by his attending physician and returned. On this form are two statements if it refers to individual insurance, and a third statement if it arises from group insurance, which are as follows:

1. "The Insured's Statement". This contains his identification, i.e. name and address, and the certificate number and the name of the company insuring him. It also contains an authority for the attending physician to release any information requested with respect to the claim.

2. "The Attending Physician's Statement". There are two types of such statement–

(a) Attending physician's statement for medical care: This contains the usual medical questions necessary to establish the claim, i.e. a record of the professional services rendered and the fees charged for the same. As an alternative to entering the fees charged, a physician may always attach an itemized account. It should be understood that the schedule of indemnities paid to a patient for medical care which he has undergone are related to the premium paid, and may not be equal to the fee charged. The implications of this are liable to be misunderstood when the insured makes use of the "Assignment Form" or "Authorization to pay Physician", which has been included on these forms at the request of the profession, to be used if he so desires. The assignment authorizes the payment directly to the physician of the benefits provided by the policy, but not to exceed the fee charged by the physician. The claimant further states in the form, "I understand I am financially responsible to the physician or surgeon for charges not covered by this authorization."

(b) Attending physician's statement for lost-time benefits: This contains the medical questions necessary to establish that the insured has been totally disabled (unable to work) between certain dates, and if still disabled the approximate date on which he will probably be able to return to work. This latter question is asked so that the insuring company may avoid bothering the physician unnecessarily frequently, if it is going to be a prolonged disability. Such questions as these can, of course, only be answered to the best of the physician's knowledge, and this is understood. It is necessary to request professional certificates of total disability to prevent unreasonable claims in this field.

3. "The Employer's Statement." This will also identify the claimant and give the group policy and certificate number, and usually the name of the employer, insurer, and certain other pertinent information of importance to the group.

These claim forms have been a source of considerable irritation—to the profession because of lack of uniformity and the multiplicity of forms, and to the insurers because of the failure of physicians to complete the required questions in full. Currently a Joint Committee on Uniform Claim Forms of the Canadian Medical Association and the Canadian Health Insurance Association (C.H.I.A.) is sitting, which hopes to make these forms uniform, and to reduce them to a minimum number containing only essential questions. This should remove most of the profession's criticism and ensure its co-operation in the completion of the forms, thereby facilitating the work of the insuring company.

Delay in completing the life and health insurance examinations, reports and claim forms results in extra correspondence with increased costs. In life insurance the applicant may be killed or die, or become medically impaired before completing his arrangements for insurance, thereby causing financial loss to himself or his dependents. In health insurance it results in delay in the payment of the attending physician's bill and occasions the claimant unnecessary financial hardship. In both cases the company may lose the policy, and the agent his commission. All of these results are most undesirable and cause poor public relations for all concerned.

THE SOLUTION OF PROBLEMS OF INSURANCE MEDICINE

The provision and implementation of life and health insurance requires great co-operation from all concerned, especially between the medical profession and the insurers. An inadequate knowledge of each other's problems and a lack of communication is a fertile basis upon which problems arise and misunderstandings occur. The insurance industry is very conscious of the problems and anxious to co-operate to the best of its ability in their solution. To this end, in 1958 a delegation of the Canadian Life Insurance Medical Officers Association visited the headquarters of l'Association des Médecins de Langue Française du Canada, the Canadian Medical Association and each of its Provincial Divisions. Discussions were held with the Executive Secretaries of the Associations and Divisions, with various members of the Executive Committees at each level, and informal discussions with other members of the profession in the local area. Arising from this liaison, a report and certain recommendations were made with a view to establishing better lines of communication and to solving mutual problems. This has resulted in the establishment of definite lines of communication between the profession and the industry (the Secretary of the Provincial Medical Association and the Secretary of the Canadian Life Insurance Medical Officers Association); the setting up of a Joint Committee of the C.M.A. and C.H.I.A. on Uniform Claim Forms; and the dissemination of much information concerning our mutual problems with suggestions for their solution. The Canadian Life Insurance Medical Officers Association (C.L.I.M.O.A.) is desirous of co-operating in every possible way and will arrange for the provision of speakers, both medical and other, on the problems of insurance medicine, for medical meetings at local, provincial or national levels.

CONCLUSION

Insurance medicine, i.e., the medical aspects of life and health insurance, is an essential medical service. Only by free communication, tolerance, patience, goodwill and co-operation between the profession and the industry will the problems be solved and administrative detail reduced to a minimum. Let us strive together to make this service efficient and medical care available at a reasonable cost to all, and thereby retain as a free enterprise the practice of medicine.

THE NEW GENERATION

The first thing that struck me was that the portrait [of this new generation] bears no resemblance whatsoever to the much publicized drum-beatnicks and Peeved Young Men (anger needs an object, peevishness does not). In the second place, it made me see the Teddy boys and juvenile delinquents, who in England monopolize the public's attention, as an overrated marginal phenomenon.

The composite portrait shows an earnest, sober, bland face. It is uncommitted and noncommittal. Its features provide no clues to individual character and temperament, but they already bear the professional stamp of the future manager, engineer, business man or career-woman. The girls mostly look like competent private secretaries and equally competent future mothers, whose family planning will be made dependent on the availability of baby-sitters.

The generation of the fifties has no distinct profile. They are neither libertines nor rebels, and have no desire to fight. They are indifferent to politics, not much interested in literature and the arts, and as immune against infectious isms as we in the thirties were prone to them. They seem to have no ideals except getting on in their profession, forming a limited family, going on holiday in the new car.

The astonishing thing is that these generalizations do apply to the vast amorphous majority of the young in capitalist America and in Soviet Russia, on the Continent of Europe and in Japan.—A. Koestler, *Observer*, August 16, 1959.

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MEDICAL POLITICS

Robert Burns' well-known plea for a "giftie" comes to mind on reading Professor Malcolm G. Taylor's contribution to the current issue of *The Canadian Journal of Economics and Political Science.** He entitles this article "The Role of the Medical Profession in the Formulation and Execution of Public Policy" and his purpose is to show how an "interest group" such as the Canadian medical profession influences the political process in this country. Few persons can be as well qualified as Malcolm Taylor to analyze so objectively the thoughts, the doubts and the actions of the organized medical profession which finds itself enmeshed in the past and present turmoil of sociological change. He says of us, "No other private group is so deeply involved in public administration, and this despite the fundamental antipathy between the healing arts and bureaucracy."

Dr. Taylor surveys us as a self-governing profession, and points out how unique it is that we are entrusted with the operation of the provincial Medical Acts whose basic purpose is the protection of the public against unqualified practitioners.

Turning to the voluntary medical Associations through which doctors express themselves as an "interest group", he correctly portrays The Canadian Medical Association as a confederation of divisions with the pattern clearly discernible throughout the structure of the General Council and the national committees. As examples of our interest in medical practices and standards, there are cited the work in hospital accreditation, in approval of hospitals for the training of interns, in public and professional education in cancer, in pharmacy, in nutrition and in public health. The other broad area of our activities is classified as relating to the organizing and financing of medical services. Our studies and pronouncements on health insurance and other aspects of medical economics over the past 30 years are described. The development and operation of medical services for the needy and the sponsorship of plans of prepaid medical care for the remainder of the population are pointed to as Divisional activities of considerable public benefit. The relationship of the C.M.A. to the Federal authorities in the 1942-46 studies of health insurance, to the National Health Grants and the health surveys of 1948-50 and to the 1956-59 introduction of the Hospital Insurance Program is covered in detail.

Dr. Taylor points out that the profession has not only influenced these developments but has actually had a great deal to do with their administration after the legislative phase has passed. It may surprise some doctors to read the following summation of this astute observer: "Organized medicine influences legislative policy with respect to the timing and design of public programs, guides the choice and structure of administrative agencies, prescribes certain administrative procedures, participates in the continuing decisions of administrators, and, in four provinces, actually serves as the governmental agency in the administration of major programs."

It is rarely that a profession is subjected to the scrutiny which this article provides, without going through the agonizing process of self-appraisal or at least engaging the services of an outside consultant. If this is Professor Taylor's swan song as a student of medical economics before he assumes his new appointment as Principal, University of Alberta in Calgary, and Vice-President, University of Alberta, we should be grateful that he has found so much to commend and so little to condemn.

*Vol. XXVI, No. 1, February 1960.

Editorial Comments

USE OF INERT PREPARATIONS IN GENERAL PRACTITIONER RESEARCH

It is necessary to have some yardstick for assessing the effectiveness of treatment, and this is provided in the basic requirement of a clinical trial from which valid conclusions can be drawn by the use of a "control" group. Random allocation of patients to a "treatment" group and to a "control" group must be carried out in most studies, the control group receiving inert preparations (or nothing); the attending physician should not know which patient is receiving which preparation (active or inert).

An Australian writer, Breinl (*Ann. Gen. Pract.*, 4: 17, 1959) has focused attention on the ethical, technical, and legal aspects of the use of inert preparations by general practitioners conducting research. The ethical questions at issue are whether it is proper to withhold from any patient treatment that may perhaps give him benefit: and whether the treatment under trial offers more than the usual orthodox treatment of the day, or more than no treatment at all. The patient expects and is entitled to proper treatment.

Believing that certain ethical limitations were necessary in general practice, the Council Research Committee of the Australian College of General Practitioners met in an attempt to formulate policy regarding research in general practice. They decided that trials involving the use of inert preparations were not suitable for use in general practice, and that the College should not take part in research projects which involved the administration of inert preparations.

Technically, it may be difficult for the physician in charge to collect two groups of patients which are comparable, since it is probable that he will place the more ill patients in the active treatment group and the less ill in the control group. Further, asking for volunteers for experimental treatment introduces a prejudicial factor because volunteers are likely to be considerably different from persons who do not volunteer.

As to the legal aspects, some courts may require that the patient's permission first be obtained and that another physician know the true identity of the active drug prescribed in order to protect against overdosage and warn about pending danger signals. This would present insuperable difficulties for many drug trials.

The issue is clearly an important one, and should not be settled hastily. But it is difficult to see how the objections to the use of inert substances apply only to the general practitioner.

BLEEDING ŒSOPHAGEAL VARICES TREATED BY ŒSOPHAGEAL COMPRESSION TUBE

During the years 1954 to 1958, 101 patients with gastro-intestinal hæmorrhage associated with portal hypertension were seen at Hammersmith Hospital, London. Of these, 43 had recovered from an episode of bleeding œsophageal varices without any tamponade. They were all considered to have fairly good liver function. Twenty-six were operated on (20 had portacaval anastomoses and six had other operations on the portal system) with one fatality. Of the other 58 patients who were referred to the hospital because their bleeding could not be controlled elsewhere or who were under treatment in hospital because of some other complication of cirrhosis of the liver and who were considered to be "poor-risk", 38 were treated with the Sengstaken tube. The bleeding was initially controlled in 32 but only ten of them survived to leave the hospital.

In this report by Read *et al.* (*Brit. M. J.*, 1: 227, 1960), the technique of introducing the tube and the general management of the patient with the tube *in situ* are described. Patients who come to necropsy showed evidence of ulceration of the lower œsophagus which appeared to be related to the intubation and to the use of traction. Respiratory complications which occurred during treatment with the Sengstaken tube were laryngeal ulceration, aspiration into the air passages of secretions collected above the tube, and laryngeal obstruction. The latter, due to distension of the œsophageal balloon, occurred in four of the patients.

It is stressed that hæmorrhage in these "poor-risk" patients is due not only to portal hypertension and œsophageal varices but also to the bleeding tendency found in advanced liver disease. The value of the Sengstaken œsophageal compression tube lies not only in the arrest of bleeding from œsophageal varices but also in helping to distinguish the latter from bleeding peptic ulcer. The decision when to use the tube in relation to possible later portal surgery is often fraught with difficulties. Repeated bleeding may require repeated use of the tube with increasing chances of complications. Recurrent bleeding may worsen hepatic function still further and thus preclude surgery. In such cases it is doubtful that the Sengstaken tube should be used, as it only increases the misery of the patient. No hard and fast rule can be made, however, and a case is cited in which a woman of 51, who was in hepatic coma and had ascites and bleeding varices, made a full recovery after the use of the Sengstaken tube and was alive and well five years later without subsequent surgery. W. GROBIN

ORGANIZATION OF GERIATRIC SERVICES

A common factor in many of the instances of disease in old age is what has been called social infirmity, that is, the combination of lack of money, lack of friends or relatives who can or will look after the patient in his home, and general frailty, which makes it hard for the old person to continue to battle on leading an independent existence. It is this factor that determines the scope of geriatrics.

Wallace of Melbourne attempted to learn what was going on in other countries that could be of assistance in formulating plans for geriatric services in Australia, and has reported his impression of the approaches found in Scandinavia, Britain and America (*M. J. Australia*, 2: 40, 1959).

The British scheme is to set up geriatric departments as special sections of the general hospitals with the departments headed by well-paid senior men and under them a full resident staff. This association with the hospital for acute illness has fostered a hopeful and active attitude to disease in old age. Some patients do not improve, despite the best efforts, and for these long-stay wards are provided. However, only a minority of patients admitted to hospital finish up in these wards. In Oxford, this was no more than one in five of patients admitted.

A separate feature of the British service is the close liaison between government services and voluntary organizations, where the former aid by seeing that services are not needlessly duplicated and that they are encouraged where they are needed. The accent, then, of the medical profession in Britain is on treatment rather than on provision of custodial care.

Scandinavia, and especially Sweden, mainly through the local government authority has built modern homes (no larger than 100 beds) for its old folk. The homes provide accommodation for the frail ambulant patient and the socially destitute

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patient, without class distinction, and consist of a private room with private toilet and bath and usually a small private veranda, and common lounge, dining and recreation rooms. Most of them are like good hotels in the standard of luxury provided.

In America, Wallace found the community attitude to old age, the numerous old people's classes and recreational centres, and the quantity of medical research on the ageing process commendable.

In his summary evaluation Wallace states that the best course would be to follow the British lead in setting aside wards, or at least beds, in the hospitals for acute illness and in appointing geriatric consultants to look after the ill geriatric patient; to have a definite break between hospitals and homes for the frail and needy old people (the homes to be no larger than 50-100 beds); and to increase the amount of medical research with the hope of being able to understand, and possibly to halt, the progress of the ageing process.

Charitable and church organizations could be of particular assistance by providing first-class homes of the type described, rather than by trying to build and maintain proper hospitals which would be beyond the financial ability of most private organizations.

PSILOCYBIN, ITS HISTORY AND PHARMACOLOGY

The effect of certain Mexican mushrooms in producing visions and hallucinations in human beings was described in the 16th century by a Franciscan monk.

A fascinating review of the history of knowledge concerning the mushroom *psilocybe mexicana* has recently been given by Cerletti of Basle, Switzerland (*Deutsche med. Wchnschr.*, 84: 2317, 1959). According to Cerletti, knowledge of this fungus was lost until it was re-discovered in 1953 by Wasson who with his wife, who is a physician, took part in ceremonies of tribes still using this "holy mushroom" for its intoxicating effects. Having obtained the mushrooms, he sent them to a French mycologist, Hime, who cultured them artificially and was able to extract the active drug. By 1958, the substance, which was named psilocybin, was extracted in crystalline form and was found to have the activity ascribed to the original mushroom. Cerletti describes the relationship between such tryptamines as serotonin and psilocybin and its derivative psilocin, and the latter's structural resemblance to lysergic acid-diethylamide. It was found in the Sandoz laboratories that the activity of the sympathetic nervous system is stimulated by psilocybin to a smaller degree than by lysergic acid-diethylamide. In contrast to such agents as serotonin, psilocybin regularly produces exaggeration of monosynaptic spinal reflexes. Its effect on the circulation is only slight; sometimes it causes mild hypertension but also occasionally hypotension. Its effect on isolated organs is also insignificant, with one exception, and that is its marked antagonistic action to that of serotonin on smooth muscle of the rat's uterus.

Systematic examination of its action on human subjects was carried out by volunteers in Basle during 1959, and results can be summarized as follows: Small doses of a few milligrams produce within 20 to 30 minutes both somatic and mental changes. The somatic effects are mainly neurovegetative, such as mydriasis, hyperreflexia, hypertension or hypotension, changed pulse frequency, etc. In small doses the drug produces a change in mood and in contact with the environment which is subjectively pleasant and consists of relaxation and detachment from the outside world. In higher doses, changes in orientation and psychosensory phenomena develop, such as visual hyperæsthesia, illusions and hallucinations. They are, however, not as frequent as those following lysergic acid-diethylamide and especially following mescaline.

Delay and co-workers have recently reported the therapeutic effect of psilocybin in a compulsion neurosis. It is known that similar observations have been made by other investigators, but it is too early to come to definite conclusions in this respect. There may be some advantages to therapy with this drug as compared with lysergic acid-diethylamide, whose prolonged action and consequent production of anxiety are a well-known deterrent to its widespread use. Cerletti expresses the hope that clinical investigation combined with biochemical clarification of the connection between psilocybin and endogenous metabolism of indol will succeed in removing the mystery from these small mushrooms with their traditional magic action.

W.G.

A NEW LOWER LIMB PROSTHESIS

Under the auspices of the department of orthopædic surgery of the University of Cape Town, Professor Lewer Allen has brought out a new form of lower limb prosthesis. He points out that existing prostheses produce an awkward gait involving much effort and discomfort. After several years' work he has produced an artificial limb with mechanisms which allow of a gait much closer to that of the normal. These mechanisms are enclosed in a light metal skeleton-like housing on which plastic foam and sorbo rubber are built.

Professor Allen's paper in the *South African Medical Journal*, February 13, 1960, must be consulted for details. It is felt that this prosthesis not only will be of great value in its present form, but will lead to further research and modifications.

The limb has been patented by the University of Cape Town but it has been arranged that no royalties will be drawn from the invention; even the research unit of Professor Allen's department of orthopædic surgery is foregoing any such profit, their desire being to protect the handicapped from any additional expense.

Medical News in brief

WHAT SALICYLATE IS BEST?

Comparison of the relative advantages of choline salicylate (Arthropan Liquid – Purdue, Frederick) and aspirin is made in *The Medical Letter* (Vol. 2, March 18, 1960). It has been stated that Arthropan gives high salicylate blood levels and therefore anti-inflammatory effects more rapidly than does aspirin. The therapeutic extent of the difference, however, appears limited since repeated salicylate dosage is the rule in arthritis, and adequate anti-inflammatory doses of aspirin or sodium salicylate give sustained plasma levels of salicylate for over eight hours. Effective blood levels with aspirin are obtained in less than 60 minutes according to two studies by Batterman and Cronk (*New England J. Med.*, 258: 213 and 219, 1958), and even faster absorption of aspirin can be achieved if it is taken with one or two grams of bicarbonate of soda and water. Sodium bicarbonate, it is true, will depress salicylate blood values if given repeatedly, by promoting renal excretion, but the amount of alkaline agents in "buffered aspirin" is too small to affect either absorption or excretion appreciably. It does not appear that Arthropan gives analgesic effects more rapidly than does aspirin. One point which is under investigation is whether Arthropan might cause less gastro-intestinal bleeding than can ordinary aspirin. Pierson in a talk before the Eastern Section of the American Federation for Clinical Research on December 11, 1959, presented some evidence that Arthropan did cause less of this bleeding. However, confirmation of the point is still needed. If it should turn out to be true, then Arthropan may be preferable to aspirin in cases where large doses of aspirin may cause gastro-intestinal bleeding, as in peptic ulcer, for example.

It is felt that Arthropan is an acceptable soluble salicylate but has no advantage over the older soluble salicylate, sodium salicylate, and further its cost is about ten times the cost of the equivalent dosage of aspirin.

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NEUROSURGICAL TREATMENT OF SPONTANEOUS INTRACRANIAL HÆMORRHAGE

On the assumption that, although there are patients with spontaneous intracerebral hæmorrhage who recover without operation and with varying degrees of disability, progressive hæmorrhage will result in death, Scott operated on 30 patients with spontaneous intracranial hæmorrhage (*J. A. M. A.*, 172: 889, 1960). The indications for surgery included signs and symptoms of increasing intracranial pressure and neurological signs of focal brain involvement; no patients with advanced cardiac, renal, or pulmonary disease were operated on.

The anatomical location of the clot was found to be an important factor in the death or survival of a patient and his subsequent neurological deficit. Twenty patients had hæmorrhage into the internal capsule, seven into the temporal lobe area, and three into the subdural space. The operative mortality for removal of hæmatomas from the temporal lobe area was surprisingly low, and in the series reported no postoperative deaths occurred. The residual neurological deficit was compatible with a useful and productive life. Fifty per cent of these patients are still alive seven to 11 years after operation. The operative mortality for removal of hæmatomas from the internal capsule was high, and both the preoperative and postoperative neurological deficit marked. Probably all of these patients would have died without operation. Some of those who survived are active within the limitations imposed on them and are glad to be alive. Twenty per cent of this group are still alive eight to 10 years after operation. This long-term survival rate compares favourably with that of patients operated on for malignancy of the lung, stomach, and other areas.

It would seem then that prompt neurosurgical intervention for spontaneous intracerebral hæmorrhage which causes focal neurological signs and progression in intracranial pressure will save lives.

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REACTION TO ROENTGEN RADIATION

To specify the early burst of signs and symptoms from toxic amounts of ionizing radiation, the broad term "radiation sickness" should be replaced by the more restricted term "initial" or "prodromal" reaction. Although it has been almost eliminated as a complication of routine therapy, the initial reaction still can be seen and studied in the rare patients who require treatment with single high doses to the entire body. Levin *et al.* (*J. A. M. A.*, 172: 921, 1960) compared early clinical manifestations displayed by 11 cancer patients after whole-body roentgen radiation in one single large dose with previous reports of "radiation sickness" and with acute sequelæ observed in patients exposed in nuclear accidents. From this comparison, the typical initial reaction to penetrating radiation in the several-hundred-roentgen range appears to be as follows: signs and symptoms—essentially in the form of fatigue, nausea, and vomiting—begin to develop within two to four hours after exposure; they reach a climax somewhere between five and eight hours afterwards; and they completely subside on the second or third day. During the intense phase of the disturbance, extending from approximately four to 10 hours after exposure, about 60% of irradiated persons experience various degrees of disability.

Despite its transitory nature, the reaction may present a major medical problem in civil defense situations. Radiation-induced dizziness, nausea, and vomiting—when occurring in patients with mechanical or thermal lesions, particularly of head and abdomen—can easily be mistaken for sequelæ of these other injuries. Thus, unrecognized, the initial reaction may jeopardize proper diagnosis.

Reassurance of the patient of the transient nature of the illness is important in preventing outbreaks of mass hysteria in an uninformed exposed population. The initial clinical picture is a very poor indicator of doses received; in a wide dose range, the severity of clinical manifestations is determined much more by individual susceptibility than by the amount of radiation received.

(Continued on advertising page 13)

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THE CANADIAN SUPPORTING COMMITTEE

to

The World Medical Association

A Message for Canadian Doctors

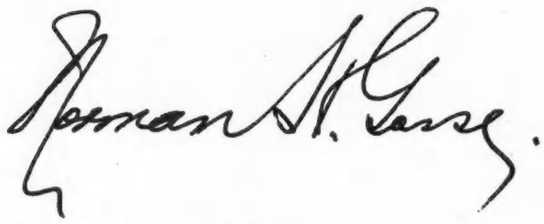
The Committee would say "Many Thanks" for the generosity of those doctors who answered its appeal published in the Journal of February 27, 1960. Contributions were from $10.00 to $250.00 each. They came from across the whole breadth of Canada and from all but one province; but the number of doctors subscribing has not been up to expectation. We look for broader support.

The doctors of the U.S.A. through individual contributions to the American Supporting Committee have carried much of the load of W.M.A. over the years. Now, without demanding less of them, it has become clear that if the reasonable requirements of International Medicine are to be met, other nations that can, must assume a reasonable share of the cost. The C.M.A.—the Canadian member of W.M.A.—speaking for you, has assumed its share, and cannot be behindhand in the leadership that is needed.

To make this effective it requires the individual support of Canadian doctors, and the C.S.C. is the medium sponsored by C.M.A. through which your interest and your support can most readily be given.

We have not instituted a high-pressure campaign such as those to which you are accustomed in most of your charitable appeals. It should not be required here. We are sure, however, that there were many who with the failing of most of us, saw the appeal, acknowledged its rightness, decided to send a cheque, got busy and promptly forgot all about it. This is the follow-up.

Gentlemen: Canadian doctors are underwriting Canadian Medicine's obligation to the less fortunate doctors and peoples of the world—and especially of the Commonwealth. Of our 14,000 C.M.A. members, how many do you think should support the effort? Will you?



Chairman,
The Canadian Supporting Committee to W.M.A.

Dr. A. D. Kelly,
Honorary Secretary,
The Canadian Supporting Committee to W.M.A.,
150 St. George Street,
Toronto 5, Ontario.

Please enroll me as a member of The Canadian Supporting Committee to The World Medical Association as a

..... member at $10.00

..... sustaining member at $50.00

..... life member at $250.00

I enclose my cheque for $..... as my contribution.

Please issue receipt to .....
(NAME)

.....
(ADDRESS)

GENERAL PRACTICE

COLLEGE WINTER CRUISE IN 1962

COLLEGE OF GENERAL PRACTICE members who may wish to pursue postgraduate studies and a Caribbean sun-tan simultaneously in the spring of 1962 can do so if they make up their minds early this year. The 1962 Scientific Assembly of the College of General Practice of Canada will be held aboard the Canadian Pacific liner *Empress of England* during an eight-day cruise from New York to Nassau and Hamilton, Bermuda.

Accommodation is being arranged for a maximum of 800 persons on board the *Empress of England* for this Assembly cruise. The vessel will leave New York on March 10, returning March 17. Scientific sessions will be held in the mornings during the outbound and return voyage with ample time for relaxation and enjoyment of cruise facilities during the trip and during the stops at Nassau, Bahamas and Hamilton.

Accommodation rates for this cruise and Scientific Assembly will range from $190 to $540 (excluding suites). Provision will also be made for a limited number of exhibitors. In May of this year, a leaflet will be distributed to all members of the College of General Practice giving precise details of the accommodation and itinerary. They will be asked at that time to make their application for accommodation accompanied by a substantial deposit. Applications will be accepted on a first-come basis with priority to general practitioners who are members of the College.

PUBLIC HEALTH

SURVEILLANCE REPORTS OF EPIDEMIC OR UNUSUAL COMMUNICABLE DISEASES

INFLUENZA

It is estimated that about 600 school children in the Victoria-Esquimalt Health Unit area of British Columbia have been suffering from an influenza-like illness. This estimate is based on the above-average school absenteeism for this time of year. From Kamloops and district, about 200 cases of an influenza-like illness have been reported.

About 30 cases of an influenza-like illness, with bronchitis and pneumonia, have been reported from St. Vincent's, St. Mary's Bay, Newfoundland. Only children are affected.

PNEUMONIA

Indian and Northern Health Services

After his return to Fort Chimo, Quebec, from Roberval Hospital, one child developed bronchopneumonia. Soon after, 16 other cases of pneumonia and bronchopneumonia occurred. One patient was evacuated to the hospital in Frobisher and five others are seriously ill.

SCARLET FEVER

Approximately 100 cases of scarlet fever, affecting mostly young children, have been reported from LaCrete, Alberta, a small community 500 miles north-west of Edmonton.

MENINGITIS

One fatal case of meningitis, presumed to be of viral origin, has been reported from Red Deer, Alberta. This one-year-old baby girl was originally admitted to hospital as a case of gastro-enteritis of viral origin. Death occurred six days after onset. Laboratory findings are not available.

INFECTIOUS HEPATITIS

One fatal case of acute yellow atrophy, secondary to infectious hepatitis, has been reported from Bentley, Alberta, in a 15-year-old girl. The diagnosis was confirmed by post-mortem examination.

Three more cases of infectious hepatitis have been reported from Camp Wainwright (Permanent Married Quarters), Alberta, bringing to seven the total number of cases since January 1, 1960.

Four cases of infectious hepatitis have been reported from Uplands R.C.A.F. Station, Ontario. The first case was in an officer recently returned from Portugal.

TRICHINOSIS

Three cases of trichinosis have been reported in Ontario for the week ending February 20, 1960.

TULARÆMIA

One case of tularæmia has been reported in Ontario for the week ending February 27, 1960.

MUMPS

Sixteen cases of mumps have been reported among children in the Permanent Married Quarters at Camp Shilo, Manitoba.

MALARIA

One case of malaria vivax has been reported from Steinbach, Manitoba. The patient, a man, 50 years old, returned recently from Central America and became ill after arrival.

SHIGELLOSIS

Twenty-six cases of bacillary dysentery due to *Shigella sonnei* have been reported in the Chamainus area of British Columbia.

International Reports

INFLUENZA

United States.—The reports received from various States generally indicate a declining incidence of respiratory infections. Isolations of type A2 influenza virus have been made in 31 States and serological confirmation of diagnosis has been made in four additional States.

Denmark.—From February 14 to 20, 2493 cases of influenza were notified in Copenhagen, against 1640 the previous week.

Sweden.—The number of cases notified from February 14 to 20 rose to nearly 16,000, twice as many as in the previous week. Virus isolations and serological tests have confirmed that the infection is due to virus A2.

Switzerland.—The number of cases notified continues to decline, 10,905 from February 14 to 20 against 14,783 the previous week.

Epidemiology Division, Department of
National Health and Welfare,
March 12, 1960. Ottawa.

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LETTERS TO THE EDITOR

HERPES ZOSTER AND VARICELLA

To the Editor:

Although it is commonly understood that there is an antigenic relationship between the virus of varicella and that of herpes zoster, there is no dogmatic statement in any common textbook of medicine that they are identical.

I have recently had occasion to see two patients in whom the eruption of localized herpes zoster preceded the eruption of generalized varicella by a matter of ten days or so. The first case was that occurring in a 66-year-old man with Hodgkin's disease. On August 11, 1959, this man presented with a very severe herpes zoster in segments supplied by T 1 and 2 on the right. On August 22, 1959, a generalized and severe eruption of varicella occurred. The second case was that occurring in a boy of 5½ years. On March 5, 1960, this boy exhibited a localized eruption of herpes zoster involving S 1 and 2, right scrotum and buttock. On March 17, a generalized eruption of varicella occurred.

The incubation period of varicella is stated to be from 14 to 21 days. On the evidence of the above and assuming that the identical virus is responsible for herpes zoster and varicella, the incubation period of the former would therefore be from two to nine days. In addition to the above two cases I had also in January a case of encephalitis occurring three days after the eruption of varicella in a young man of 19: a neurotrophic manifestation of the normal dermatotrophic virus.

I submit that the viruses of chickenpox and shingles are not only antigenically similar but are identical.

A. M. STOBIE, B.M., B.Ch.

128 Erie Avenue,
Brantford, Ont.,
March 25, 1960.

HANDLING OF MASS BURN CASUALTIES

To the Editor:

In the March 19 issue of the *Canadian Medical Association Journal,* there appears an article on the treatment of burns by the Burns Committee, Kitchener-Waterloo Hospital.

The article is one that is needed in this present day and age when one is concerned about a possible nuclear attack. However, there are some points in the treatment of mass casualties that require comment:

1. To consider every burn of over 10% to be a major burn would certainly overburden the existing medical facilities. One has only to recall that in Hiroshima there were over 20,000 burn cases and only 36 physicians in the early phases of the treatment. A more conservative view would be to consider burns of over 20% to be major and treated accordingly.

2. The Evans rule for fluid therapy is all well and good—provided you have personnel who understand its use. In the event of a nuclear attack, the biggest problem would be thermal injuries, and it would be more practical to teach simple first-aid procedures, e.g. 1/3 teaspoon salt and 1/3 teaspoon baking soda in a quart of water given *ad lib.* and p.r.n. either by the patient or by a first-aider.

3. Oral antibiotics would be necessary to control widespread and universal infection, but it might be difficult to find enough needles and syringes to give the prophylaxis suggested in the article.

4. The exposure method or use of aluminum powder would be the only practical methods of dealing with a large number of burns.

The care of mass burn casualties is a subject that requires a great deal of investigation and thought by all general practitioners.

R. B. PRITCHARD, M.D.,
(S/L, R.C.A.F.)
c/o JABC School,
Camp Borden, Ont.,
March 28, 1960.

THE ACTION OF FLUORIDES

To the Editor:

May I comment on Dr. W. G. Nikiforuk's letter in the *Canadian Medical Association Journal* (82: 227, 1960) concerning Dr. W. A. Costain's observations (81: 954, 1959) on ill effects from fluoride?

It would, of course, have been desirable for Dr. Costain to present details concerning the cases which, he believes, manifested evidence of fluoride intoxication. Dr. Costain could have been in error regarding the dose of 3 micrograms of NaF and 25 micrograms of CaF_2.

However, clinical observations of a practising physician should not be disregarded merely because they do not fulfil the standards of a dental research institute.

At present, no clear-cut laboratory and biochemical criteria are available[1] to be utilized for the diagnosis of fluorosis. Therefore, presentation of clinical observations should not be discouraged, particularly not by emotionally toned terms and by attempts to ridicule; they have no place in scientific publications.

In spite of the voluminous literature, there are many unknowns on the subject of fluoridation to which the experts named by Dr. Nikiforuk have failed to provide an answer.

For instance, if the F^- content of a normal kidney is given as 0.78 p.p.m. (parts per million) and that of a kidney in acute fatal intoxication as 11.6 p.p.m.,[2] how can the same author who is considered one of the experts, in a subsequent article[3] disregard an F^- level of 181 p.p.m., claiming that F^- caused no ill effect; no attention was paid to this discrepancy, no clinical details of the case were presented.

In the lens of a 15-year-old patient with a cataract, whose illness was suspected to be fluorosis, I found as much as 77.3 p.p.m.; in the calcified aorta of another individual, 158.0 p.p.m. Can such data be dismissed by stating that "experts" have found no harm?

Fluoride is not harmless, like chloride or bromide. It is known to be the most reactive of all elements. It occurs commonly in nature. My own determinations from various parts of the country show that, in certain areas, foods contain much higher levels of F^- than are reported by Public Health Service experts.[4]

Under certain conditions, air is contaminated by F^- at much higher levels than generally assumed. Some drugs, especially calcium preparations, are contaminated by F^-.[5]

Public Health Service statisticians reported that no harm occurred from natural fluoride water in Bartlett, Texas,[6] at 8 p.p.m. Yet, 24 publications (references

enclosed) from various parts of the world by competent clinicians independent of each other, describe serious crippling fluorosis from water ranging mainly between 3 and 8 p.p.m.; in some instances even below the so-called safe concentration of 1 p.p.m. These observations cannot be dismissed by the usual statements of experts that this cannot happen in the U.S.A., that it occurs only among malnourished individuals and in hot climates. In Italy, Argentina, and Germany, the climate is moderate; in our countries many people suffer from malnutrition.

Several publications of mine[7-10] describe harm from fluoridated water, particularly evidence of disturbance of the Ca-P metabolism and allergic disorders. Initially, slow insidious onset and vague symptoms, and gradually increasing disability—as is to be expected in chronic intoxication—characterize the disease. In the early stages, these manifestations are reversible. Double blindfold procedures established their relation to fluoride.

Feltman has reported gastro-intestinal symptoms and atopic dermatitis from administering tablets as a tooth-decay preventive. An internationally known French dermatologist has provided me with the case report of allergic manifestations caused by fluoride-containing steroids. The symptoms were reproduced by blindfold control studies; non-fluoride-containing steroids failed to reproduce the symptoms. Similar observations were made recently when, in conjuction with a team of university professors, I visited an Italian town where fluorosis is endemic.[4]

Detailed data on this material will be presented in a comprehensive monograph which I am preparing.

A categorical statement that experts consider such reports unreliable or "undocumented" does not appear to be a scientific approach.

Dr. Nikiforuk could indeed contribute to the clarification of this involved subject were he to clearly outline for the Journal the diagnostic criteria on the basis of which he, personally, would establish the diagnosis of fluoride intoxication, both acute and chronic. He will find the medical literature on this point highly confused and contradictory.

To state that millions are drinking fluoridated water and therefore such water must be safe does not constitute scientific evidence any more than to maintain that smoking causes no ill effect because many millions have been smoking cigarettes for generations.

GEORGE L. WALDBOTT, M.D.

2930 West Grand Blvd.,
Detroit 2, Mich.,
February 26, 1960.

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"HONOUR A PHYSICIAN"

To the Editor:

I have just read Philip Auld's book, "Honour A Physician", and immediately thereafter read the review in your journal of March 12, 1960, page 613.

I agree that Dr. Auld has picked and painted his characters well. The characters are there in everybody's practice. He merely uses them well to illustrate his theme.

I can't quite agree that "malice is the characteristic of the author". To me he was simply carrying out the theme. Similar characters turn up amongst the politicians and the doctors here. Any Saskatchewan doctor and most Canadian doctors cannot but chuckle over the fact that any similarity to Canadians, real or imaginary, is purely coincidental.

The appearance of this book in Canada is most timely, and it elucidates several points that are vital to sound thinking in medical economics:

1. A "service fee" is essential in any health service: (a) if the doctor-patient relationship is to stay on a decent level; (b) if unnecessary demands for service are to be prevented from swamping the doctor's ability to render essential service; and (c) if costs are to be kept within sensible limits.

2. Even the enunciation of "Voce's Law" is not just a cynical wise-crack. His dictum "The more you do for some people, the more they'll spit in your eye" is too often true. It applies to people en masse much more than to individuals—and particularly to politicians. For example, I have just heard a Saskatchewan politician on TV say, "If too many people are in the hospitals today, it is the fault of the doctors—they let them in", quite forgetting that it is the politician who urges patients to demand free services, while the doctors fight a losing battle to find a few beds for the really sick. Canadians are susceptible to the same follies, foibles and fancies as the British.

Every Canadian doctor and his wife should read this book.

A SASKATCHEWAN DOCTOR.

March 28, 1960.

THE CANADIAN PSYCHOANALYTIC SOCIETY

To the Editor:

The Canadian Psychoanalytic Society—Société Canadienne de Psychanalyse (1637 Sherbrooke Street West, Montreal) has published a report for the two academic years 1957-1959. In 1957, the Society was elected a component society of the International Psycho-Analytical Association. The Society's membership is now 24, those resident in Canada being in Montreal, Toronto and Vancouver. Several Canadian citizens who intend to return to Canada are in training in England, France or the United States.

The Society's training program was inaugurated in 1958, and the first series of lectures and seminars began in Montreal in the spring term of 1959. The first class is made up of students resident in Montreal and Toronto. In addition to these ten students, eight others—some new students, some transferred from other training facilities—were accepted for training.

In 1958, a Trust Fund, the Canadian Psychoanalytic Society Fund—Fondation de la Société Canadienne de Psychanalyse, was set up to assist students and psychoanalysts to pursue studies and research in psychoanalysis, by way of loans, grants, bursaries and otherwise.

During the two academic years 1957-1959, 13 scientific meetings, attended by the membership and invited guests, were held in Montreal. Four scientific meetings in Montreal, and one meeting in Toronto, were open to members of related professions.

W. CLIFFORD M. SCOTT,
Secretary.

1637 Sherbrooke Street West,
Montreal 25, Que.,
March 25, 1960.

GROUP INSURANCE PLAN FOR PUBLIC SERVICE

To the Editor:

A careful study of the group surgical-medical insurance plan for employees in the public service of Canada, developed from recommendations of the National Joint Council of the Public Service of Canada, made to the Government as a result of a detailed study of this field over a period of years, warrants our congratulations to its founders.

The plan is national, not regional. It is based on sound business principles, acceptable the nation over. It plugs many of the leaks in our earlier plans, such as over-use by patient or doctor. One fee value for one procedure is recognized, whether done by specialist or generalist. Division of fees, though not mentioned as such, is morally possible but unnecessary, as each doctor submits his account to his patient.

The doctor's interest is excellently protected: first, no account is paid by the scheme until the deductible is paid; and second, the patient is liable for any fee differential. The fee schedule is quite representative of our minimum fee schedule. The profession is relieved of the need to subsidize the plan to keep it solvent. One fee only is recognized; extra billing is at the doctor's discretion.

This plan may well form the basis for national health care in the future. It interferes in no way with the present medical standards of our nation. The patient is free to choose his doctor, the doctor his patient. I see not the least suggestion of socialization of the profession; yet in this plan lies the nucleus for meeting the social health needs of our nation.

The cost to the patient is minimal, the coverage adequate. Even Tommy Douglas will have to go some to offer Saskatchewan a more acceptable plan.

J. F. EDWARD, M.D.

615 Medical Arts Building,
Winnipeg 1,
March 21, 1960.

POSTOPERATIVE REACTIONS

To the Editor:

Over the last several months, the McKellar General Hospital has had 11 severe immediately postoperative reactions consisting of pyrexia (temp. 105-107° F.); transient granulocytopenia (a white blood count of less than 1000 within a few hours of the reaction, later rising to about 30,000—98% polymorphonuclear leukocytes); severe shock requiring intravenous vasopressor drugs in high doses (up to 28 c.c. levarterenol (Levophed)/litre for two to five days); mental confusion and agitation of a varying degree; followed by a marked eruption of herpes simplex lesion in the mouth and on the circumoral and malar areas in about two to three days. One case was fatal. Only one patient received a blood transfusion. We believe that it may have been a pyrogenic intoxication or inhalation during the operative procedure (some as minor as a tooth extraction). Reactions which may have had a similar etiology have been reported following cardiac catheterization.[1, 2] A septic abortion accompanied by vascular collapse has been reported.[5] Detergents have been suggested as a vehicle.[3, 4] However, no positive cause has been established in our cases.

Our hospital staff would like to know whether other hospitals have experienced any similar reactions and what theories, facts or leads may have been uncovered. Any reference to literature or personal reports of similar experiences would be appreciated by the undersigned.

G. H. MORRISON, M.D., F.R.C.P.[C.],
Section of Medicine.

McKellar General Hospital,
Fort William, Ontario,
March 22, 1960.

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"WE WISH WE HAD WRITTEN THAT"

To the Editor:

This quotation is from a leading article in *The Times* of London ten years ago. The subject was the hardships and inadequate remuneration of specialists in training, and the phrase which caught my attention:

". . . driven to work hard by that agony of ignorance which only a medical man can know."

A. F. PHILLIPS, M.D.

11149-85 Avenue,
Edmonton, Alta.,
March 3, 1960.

To the Editor:

When seeing patients receiving bed-rest treatment, I often wish I had penned the following:

"Look at the patient lying long in bed. What a pathetic picture he makes! The blood clotting in his veins, the lime draining from his bones, the scybala stacking up in his colon, the flesh rotting from his seat, the urine leaking from his distended bladder, and the spirit evaporating from his soul."

These words were written by Asher, but I regret I cannot be more specific in my reference.

JOHN S. WHITTAKER, M.B.

April 4, 1960.

OBITUARIES

DR. A. C. DRISCOLL, 83, died at his home in Trenton, Ont., on February 23. He had been in ill health for the last ten years. A native of Trenton, Dr. Driscoll went to Queen's University for his medical studies and graduated there in 1904. His entire medical career was spent in general practice in Trenton, and on his retirement in 1955 a gold-headed cane was presented to him by the Hastings and Prince Edward Medical Society in recognition of his 50 years as a medical practitioner in the area. He had for a time held the position of medical health officer for the town. In 1951 Dr. Driscoll was appointed an honorary staff member of the Trenton Memorial Hospital.

Le DR EDMOND DUBE est décédé le 11 mars dernier à l'Hôpital Ste-Justine à l'âge de 65 ans. Il était attaché à cet hôpital depuis 1920 et en avait été nommé directeur médical l'année suivante, fonction qu'il continua d'exercer jusqu'à sa mort. Le Dr Dubé avait fait ses études classiques au Collège de Joliette et avait reçu son doctorat en médecine de l'Université Laval de Montréal en 1918. Il fit ensuite des études post-universitaires à Paris où il se spécialisa en chirurgie infantile. Il fut doyen de la Faculté de Médecine de l'Université de Montréal de 1944 à 1950. Il était également professeur émérite de chirurgie infantile à cette même faculté et chef du service de chirurgie infantile à l'Hôpital Ste-Justine depuis 1933. Le défunt appartenait au Collège Royal des Médecins et Chirurgiens du Canada dont il fut président (1951-1953), à l'American Surgical Association, à l'American College of Surgeons et à l'Association Médicale Canadienne dont il était membre depuis 1939. La Rédaction offre ses condoléances les plus sincères aux membres de sa famille.

DR. ERDMAN PENNER, 87, died in the Rosthern Union Hospital, Rosthern, Sask., on March 14 after a short illness. He was born in South Russia in 1873, and came to Canada with his parents in 1874. He received his early education in Gretna, Manitoba, and graduated from McGill University in 1901. He served two years' internship in the Royal Victoria Hospital, Montreal, and moved to Rosthern in 1903. From 1904 to 1909 he practised in Winnipeg, after which he returned to Rosthern, where he remained until his death. He was a life member of the Saskatchewan College of Physicians and Surgeons. The community of Rosthern owes Dr. Penner a great debt of gratitude for his untiring service during many hard years.

He was predeceased by one daughter and one son, and is survived by his widow. J.F.J.

DR. J. HINSON WEST of Moncton died on February 27, aged 73. He was born in Moncton, where he received his early education. He obtained his medical degree at McGill University in 1915. Dr. West was in charge of a Dr. Grenfell Hospital at Harrington, after which he served as a medical missionary in India. In 1949 he joined the department of cardiography in the Moncton City Hospital.

Dr. West is survived by his widow, two daughters and two sons. A.S.K.

PROVINCIAL NEWS

ONTARIO

Dr. Robert Usher, Royal Victoria Hospital, Montreal, visited the pædiatric department of the Kingston General Hospital for two days in March. He delivered the Dr. Janet Darling Memorial Lecture. His excellent paper, entitled "The respiratory distress syndrome of prematurity", covered the clinical features and the biochemical disturbances associated with the condition. He also discussed the program of therapy which he is investigating.

Dr. E. H. Ahrens, Jr., of the Rockefeller Institute for Medical Research, New York, addressed the graduate students and staff of the department of physiology, University of Toronto, in February and March. His lectures were entitled "Problems in fat metabolism". The first lecture dealt with analytical aspects and the second lecture with studies in man.

LILLIAN A. CHASE

QUEBEC

No doubt everyone has read in the daily press the announcement, by Premier Barette of Quebec, of the appointment of an official commission to study the problem of a hospital insurance scheme for this province. The chairman of the commission is Mr. Gérard Favreau, chairman of the board of the Industrial Life Insurance Company. As in all such important activities, there are those who have expressed some disappointment about the make-up of this commission. On the whole, however, the members selected will give assurance that the many problems to be examined will be dealt with from the widest possible viewpoint. There is ample provision for them to call on various experts, specialists and technical advisers. The commission has been given until December 1 to make its final report and recommendations for the setting-up of a provincial hospital insurance plan. We will look forward eagerly to the findings of the Favreau Commission and wish them well for their vital undertaking.

The Province of Quebec Association of Hospital Auxiliaries held their Annual Convention at the Queen Elizabeth Hotel in Montreal from February 24 to 26. This was held jointly with the Second Annual Convention of the Quebec Hospital Association. Over 250 delegates representing 46 hospitals in the province represented the latter association. Economics formed an important part of the total program. This affiliation of the Quebec Hospital Association and the Women's Auxiliaries aims at uniting strength for the benefit of the hospitals. Although they retain autonomy, there is great need for close association in order to assure the best medical care.

In March, Montreal saw several large medical assemblies. Numerically, the largest was probably the Fourth Annual Scientific Assembly of the College of General Practice (Medicine) of Canada. This was held from February 29 to March 3 at the Queen Elizabeth Hotel.

During March also, two general meetings were held by the Montreal Medico-Chirurgical Society. On

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Monday evening, March 7, and beginning with a buffet supper at 6.30 p.m. a meeting was held at the Jewish General Hospital. Dr. Charles S. Davidson of Boston City Hospital and Dr. Charles G. Child of the University of Michigan discussed the management of cirrhosis, including portal hypertension. They first presented a historical survey of our understanding of cirrhosis and its pathogenesis. They then discussed treatment; first, as directed toward the liver itself and, secondly, of the complications. Among complications they considered ascites, œsophageal and gastric varices, hepatic coma, infection, nutrition disturbances, endocrine disturbances and the internist's problems relating to surgery in patients with cirrhosis. In addition, cardiovascular, gastro-intestinal, pancreatic and renal complications were dealt with. Emphasis was laid on the correlation of pathological physiology with treatment.

On Monday, March 21, Dr. Carl Tessmer, chief of the basic sciences division and head of the radiation pathology branch, U.S. Armed Forces Institute of Pathology, Washington, spoke on the effects of irradiation on tissues. Dr. Tessmer gave a well-planned presentation of data on irradiation on human and animal tissues selected from the enormous amount of material available at the Institute of Pathology. His interpretation was principally of basic phenomena that occur within the cell following radiation. The last part of his presentation was on two human cases which illustrated that the basic pathology was the same as that shown in experimental studies.

It is a pleasure to report that Dr. Charles H. Hollenberg of Montreal has been appointed a Markle Scholar for research work in medical science at McGill University, effective July 1. A. H. NEUFELD

NEW BRUNSWICK

Dr. J. G. MacLean of Saint John was the guest speaker at the Hôtel-Dieu Hospital at Chatham on March 9 when he discussed the management of common problems in dermatology. Local physicians presented current cases of interest for discussion.

The Hon. J. F. McInerney, M.D., Minister of Health and Social Services, has been elected to membership of the Royal Society of Health, London, England. Dr. McInerney, in spite of his government duties, continues to take a very active part in medical affairs.

The Atlantic Provinces Orthopædic Society was formed at a meeting in Moncton on January 16. Officers elected at this organization meeting were: President, Dr. A. W. Ewart, Moncton; Vice-president, Dr. T. B. Acker, Halifax; Secretary-Treasurer, Dr. K. Seaman, Saint John. This new Society was preceded by a small group of New Brunswick orthopædic surgeons who met for discussion of their special interests. The objective of this group is the advancement of the art and science of orthopædics in all phases, particularly in reference to problems in practice and training in these provinces. The meeting was held during the worst storm of this winter in the Maritimes, where winters are often old-fashioned. The new group has already made plans to participate in the Canadian Orthopædic Conference at St. Andrews in 1961.

Dr. A. F. Chaisson is acting district medical health officer for Kings, Saint John and Charlotte counties, and Dr. J. R. Allanach is acting for the counties of Queens and Sunbury. A. S. KIRKLAND

NOVA SCOTIA

Dr. James F. Ross, a graduate of Dalhousie University, who spent 1958 and part of 1959 in London, England, studying plastic surgery, has opened an office at 324 Spring Garden Road, Halifax, for the practice of plastic and reconstructive surgery.

The recent meeting of the American College of Surgeons held in Boston was attended by a good representation from the Department of Surgery here. Drs. Gordon Bethune and Arnold Noble, accompanied by their wives, journeyed to Boston by sea. Drs. James Purves, Alan Myrden, Jack Charman, Alan Curry, Fred Barton and Edwin Ross journeyed by air. Dr. Ross, accompanied by Mrs. Ross left for a short holiday in Bermuda at the termination of the meeting. Dr. and Mrs. Noble continued on to New York for a further holiday.

At the recent meeting in Montreal, Dr. Murray Fraser of Halifax was elected President of the College of General Practice for the year 1960-61.

Dr. Arthur L. Murphy, surgeon, author and playwright of Halifax, had his play "The Death Around Us" produced on the General Motors Corporation television show on March 13. This is the second time that this playwright has had a play produced by General Motors, the other occasion being in the fall of 1959 with "You Will Be Calling Me Michael". The TV production of "The Death Around Us", which dealt with hospital infection, was well received here. However, the playwright himself was somewhat critical of its ending, which he says was changed without consultation. Dr. Murphy was also critical of the way tension was broken through the introduction of a vaudeville comedy team. This addition forced parts of the original play to be cut, making it confusing and unstable.

Dr. Donald M. Grant has succeeded Dr. A. B. Campbell as chief medical referee of the Workmen's Compensation Board of Nova Scotia.

Dr. H. L. Scammell has resigned from the Workmen's Compensation Board to become executive director of the Nova Scotia Alcoholism Research Foundation. Members of the Board and medical officers and their wives presented gifts to Dr. and Mrs. Scammell at a farewell dinner given at the Lord Nelson Hotel.

The construction of a 68-bed hospital at Middleton has been approved. This hospital will cost approximately one million dollars and will be in operation by the fall of 1961.

Dr. and Mrs. A. M. Siddall of Pubnico left Nova Scotia early in February for a Mediterranean cruise which will include a safari into the big-game country of Tanganyika. They expect to be away three months.
WALTER K. HOUSE

ABSTRACTS *from current literature*

MEDICINE

Radioactive Iodine (I^{131}) in the Treatment of Chronic Pulmonary Insufficiency.

L. T. ELLISON *et al.*: *Am. Rev. Respiratory Dis.*, 80: 181, 1959.

The treatment of chronic pulmonary insufficiency is often discouraging despite the judicious use of all standard forms of therapy. In patients with pulmonary disability, dyspnœa occurs when the breathing requirement approaches the breathing capacity. It is reasonable to suggest that a reduction of the metabolic demands of the body by inducing hypothyroidism with radioactive iodine will decrease breathing or oxygen requirements and thereby lessen dyspnœa.

To test this hypothesis 23 patients with severe pulmonary insufficiency were followed up for two and one-half years to three and one-half years after treatment with radioactive iodine. Clinical improvement was excellent in seven patients (30%), good in two (9%), fair in six (26%), and poor in eight (35%). Pulmonary function studies revealed no significant improvement in lung volumes or in the mechanics of breathing. In the majority of patients, oxygen uptake and I^{131} uptake were reduced, total and alveolar ventilation decreased, alveolar and arterial oxygen tension increased, and the arterial carbon dioxide tension decreased. The clinical improvement did not always correlate with the values determined in the laboratory.

These clinical results are gratifying when the severity and duration of disease in the patients are considered. Even a "fair" response meant a great deal to the patient. While it is difficult to predict which patient will respond favourably to therapy with I^{131}, it seems that the euthyroid patient with decreased arterial oxygen tension and increased arterial pressure of carbon dioxide is most likely the one to be helped.

S. J. SHANE

Clinical Value of Liver Photoscanning.

D. A. FEE AND S. O. FEDORUK: *New England J. Med.*, 262: 123, 1960.

Photoscanning after intravenous administration of radioactive rose bengal dye was carried out on 250 patients over the last two years. The Reed-Curtis photoscanning apparatus is described and actual photographs of a normal-sized liver and of an enlarged one owing to cardiac failure or to metastases are presented. Although some of the photoscans of the liver are difficult to interpret, increased experience should improve the interpretation of findings. The authors are enthusiastic about the preliminary results obtained and believe that the investigation of masses in the upper abdomen will be greatly enhanced by the use of this technique.

W. GROBIN

Studies of Regional Lung Function Using Radioactive Oxygen.

N. A. DYSON *et al.*: *Brit. M. J.*, 1: 231, 1960.

A method is described whereby radioactive oxygen is used to assess the ventilation and blood-flow in the lungs. After inhaling air containing a trace of radioactive O^{15}, the patient holds his breath for about 12 seconds. During this period the radioactivity of the chest is measured by counters aligned in pairs anteriorly and posteriorly. The method has the advantage of being very simple, does not involve any discomfort to the patient, and is practically free of radiation hazard. Calculations are shown which indicate that the testing of eight breaths involves exposure to radiation comparable to that from a chest radiograph. Illustrative cases demonstrate the absence of ventilation in the lung of a woman with severe chronic fibrosis, greater ventilation than normal in the lung above a large cyst in one man, and abnormally increased flow in another lung with anomalous return of pulmonary veins to the superior vena cava. In a patient with pulmonary artery thrombosis, the abnormal lung showed much reduced clearance rate which rose appreciably after exercise. The value of this test at present lies in investigating discrete pathological lesions within the lung which cannot be evaluated by other methods. Because of the short life of O^{15} (two minutes), this method can be used only where O^{15} is manufactured. Isotopes with a longer life could be used, but it has to be kept in mind that the radiation hazard would be greater.

W. GROBIN

SURGERY

Recent Advances in the Treatment of Peripheral Arterial Embolism.

R. J. KRAUSE *et al.*: *A.M.A. Arch. Surg.*, 79: 285, 1959.

The earlier embolectomy is undertaken, the greater the chance of limb survival in the lower extremity. Most upper limb embolisms can be treated without operation. Heparin preoperatively may be of significant value, and there is no question of its value during and after operation, as advocated for many years by Gordon Murray. The interval between lodgement and removal of the embolus is not an inflexible criterion of operability, for there are many reports of limb survival after many hours longer than the advised maximum of ten hours. Techniques for the removal of propagating thrombus and of flushing out emboli are described. Prolonged, often permanent anticoagulant therapy is recommended after embolectomy.

There is little that is new in this field.

BURNS PLEWES

Surgical Treatment of Atherosclerotic Occlusive Lesions in Cerebral Arterial Insufficiency.

E. S. CRAWFORD *et al.*: *Circulation*, 20: 168, 1959.

These authors describe arteriographic studies performed in 174 patients with clinical manifestations of cerebral arterial insufficiency. Extracranial arterial occlusion was demonstrated in 73 patients (42%). Operation was performed on 63 of these patients, who were found to have 115 occlusive lesions.

Occlusion of the great vessels arising on the aortic arch was manifested clinically by symptoms of arterial insufficiency in the brain and upper extremities, and diminution or absence of arterial pulsations in the neck or arms. The precise location and extent of occlusion in patients with internal carotid and vertebral artery occlusion were determined only by arteriography.

At operation 75 lesions were found to be segmental in nature, with a normal extracranial segment both proximal and distal to the obstruction. Endarterectomy in 37 well-localized lesions and graft bypass in 38 more extensive occlusions restored circulation in 72 arteries. Anatomically, the circulation was restored in all cases with lesions in the great vessels arising from

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the aortic arch, 97% of those with operable lesions of the internal carotid artery, and 60% of those with occlusions of the vertebral artery.

In some cases, although circulation was restored in one or more of the occluded arteries, brain damage was persistent and the downhill course was unaltered.

Fifty-seven patients recovered and circulation was restored in one or all of the occluded vessels in 47 patients. All patients with lesions of the great vessels arising from the aortic arch were completely relieved, and the majority of patients with lesions of the internal carotid and vertebral arteries were either relieved or significantly improved. S. J. SHANE

Revascularization of the Kidney in Hypertension due to Renal Artery Stenosis.

J. C. LUKE AND B. A. LEVITAN: *A.M.A. Arch. Surg.*, 79: 269, 1959.

When impaired blood supply to one kidney is the cause of hypertension the other kidney is damaged, so that if the renal artery is the site of the block, it would be good treatment to remove this stenosis or thrombosis and preserve the kidney with the lesser parenchymal disease. Four cases are reported in which revascularization of the ischæmic kidney was attempted. Autogenous artery grafts are used, the splenic artery being the best. End-to-side anastomosis preserves the already existing renal blood flow.

The problems in choosing suitable cases for this type of treatment are described. BURNS PLEWES

THERAPEUTICS

Exacerbations of Chronic Bronchitis Treated with Oxytetracycline.

D. G. BERRY *et al.*: *Lancet*, 1: 137, 1960.

A double-blind control trial of treatment of exacerbations of chronic bronchitis with an antibiotic is reported in which general practitioners were asked to classify their cases according to their own judgment as (A) requiring an antibiotic, (B) intermediate and (C) not requiring an antibiotic. Group A was treated by the practitioners' own method whilst groups B and C were given either oxytetracyline or identical capsules containing lactose. In a total of 58 patients included in this trial, the treated patients recovered sooner and had fewer exacerbations than the controls. This was obvious and statistically significant in the patients with moderate to severe attacks; for the mild attacks the treatment did not show the same significant improvement. It is thus concluded that even in cases where antibiotic treatment is not considered essential, a patient with chronic bronchitis will improve after its administration for an exacerbation. It is interesting that of the 11 patients in group A who were outside trial and who were treated with other antibiotics, two died.

W. GROBIN

Prevention of Migraine in Children by Prochlorperazine.

R. S. ILLINGWORTH AND C. C. HARVEY: *Lancet*, 1: 132, 1960.

The claim that prochlorperazine (Stemetil) has preventive value in migraine was subjected to the acid test. A double-blind trial is described in which 32 children with typical migraine, including positive family history, were given alternatively prochlorperazine and a placebo.

The drug proved no more effective than the control placebo tablet, the inert tablet producing as many good results as prochlorperazine. W. GROBIN

Control of Lipæmia in Children with Diabetes Mellitus.

H. B. SALT *et al.*: *Lancet*, 1: 71, 1960.

The effect of insulin on the various serum lipids was studied in 14 diabetic patients between the ages of two and 14. Four of these patients had hitherto been untreated, and it was found that when insulin treatment was instituted the high values for serum total lipid, for fatty acid and for beta-lipoprotein lipid were lowered to normal within one to two days. The serum cholesterol levels remained essentially unchanged. No relationship was found between the levels of blood sugar and those of serum lipids during the 24-hour periods in patients already under good control.

In eight diabetic children under established control with insulin, feeding with sunflower-seed oil was seen to have a lowering effect on the serum esterified cholesterol and beta-lipoprotein lipid concentrations. Even under home conditions there was a definite beta-lipoprotein lipid drop in every one of them and in most of them the esterified cholesterol level fell as well. A corn-oil diet reduced esterified cholesterol and beta-lipoprotein lipid to about 60% of the initial levels; total lipid and esterified fatty acid dropped to 75%, and phospholipid to about 80% of the initial level. Where the diet was changed from corn-oil to the previous isocaloric control diet, a marked rise occurred in all the serum lipid levels. When diabetic control was allowed to deteriorate (by halving the insulin dosage), the corn-oil diet was not able to prevent a rise in lipids. The serum lipid levels became considerably elevated when the blood sugar was allowed to rise to 400 mg. per ml.

As perfect control of diabetes cannot be expected to be exercised at all times, corn-oil and other foods rich in unsaturated fats deserve long-term trial as an additional control measure for preventing hyperlipæmia.

W. GROBIN

Treatment of Certain Cancers by Regional Perfusion of Chemotherapeutic Agents.

F. SAEGESSER *et al.*: *Schweiz. med. Wchnschr.*, 90: 11, 1960.

Two cases of malignant melanoma in female patients are presented and the technique is described whereby PAM (phenylalanine mustard, sarcolysine, L-p-di (chloroethyl)-aminophenyl-alanine) was perfused into the affected limb. In both cases extra-corporeal circulation of the involved limb was established with the aid of the lung-heart machine. A high concentration of the chemical agent at the rate of 1.5 mg./kg. body weight (a total of 100 mg. in the first case and 165 mg. in the second case) diluted in propyleneglycol and added to heparinized blood was perfused through the affected limb for 30 minutes. In the second case, an additional 135 mg. of PAM was used to irrigate the abdominal wound. Relief of symptoms was fairly satisfactory but progress of the disease was only slightly delayed and the ultimate outcome was fatal.

This technique is promising and further developments in this direction may improve results in future. The authors suggest that what could be named chimiogrammes could be prepared for each cancer considered suitable for perfusion treatment. That examination would be carried out in a cancer centre where tissue cultures of the cancer could be subjected to attack by various chemical agents and the most suitable agent chosen for ultimate perfusion treatment.

W. GROBIN

DERMATOLOGY

Calcinosis in Dermatomyositis.

S. A. MILLER, R. K. WINKELMANN AND L. A. BRUNSTING: *A. M. A. Arch. Dermat.*, 79: 669, 1959.

The records of 118 patients with dermatomyositis at the Mayo Clinic were reviewed. Of 23 children with dermatomyositis 17 had calcinosis; 12 of 61 adults had calcinosis. The calcification usually occurred about the shoulder or pelvic girdles, and generalized calcinosis frequently followed. The calcinosis usually started two to three years after the development of the disease. It signaled a greatly improved prognosis for survival, but a poor outlook for functional recovery because skin ulceration and destruction of muscles frequently occurred. The pattern of calcinosis in scleroderma was quite different from that seen in dermatomyositis.

ROBERT JACKSON

Vascular Lesion of Hereditary Hæmorrhagic Telangiectasia.

R. M. BIRD AND W. E. JAQUES: *New England J. Med.*, 260: 597, 1959.

A clinical and pathological study on an elderly man with hereditary hæmorrhagic telangiectasia emphasized the fact that the telangiectasia involved large and small veins primarily. Arterial involvement was inconspicuous. All major organ systems were involved, and in each the venous defect was diffusely distributed. The site of bleeding seemed to depend more on chance or accessibility to trauma than on any predilection of the disease for a particular organ system. The cardiovascular disease may have been due to increased numbers of arteriovenous communications.

ROBERT JACKSON

Smallpox Vaccinations in the Management of Recurrent Herpes Simplex.

A. B. KERN AND B. L. SCHIFF: *J. Invest. Dermat.*, 33: 99, 1959.

A group of patients with recurrent herpes simplex was treated with multiple smallpox vaccinations, while a control group was treated with heat-inactivated vaccine. Of those given inactive vaccine 52% remained free of attacks during the follow-up period, as against 67% of those given active vaccine.

Since the difference in results is negligible, benefit obtained from vaccination is probably due to inoculation of foreign protein or other substance within the vaccine, to "suggestion", or possibly to both.

ROBERT JACKSON

RADIOLOGY

Roentgenographic Signs of Pulmonary Artery Occlusion.

D. J. TORRANCE, JR.: *Am. J. M. Sc.*, 237: 651, 1959.

The importance of atelectasis, especially linear or "plate-like" atelectasis, for the roentgenographic diagnosis of pulmonary vascular occlusive lesions is emphasized. The various morphological forms which a pulmonary infarct may present on the chest film are described. These include: pleural effusion, parenchymal consolidative densities resembling pneumonia, tumour, pulmonary œdema, the characteristic wedge density, and densities nestling in the costrophrenic angles.

S. J. SHANE

ORTHOPÆDICS

Survival of Patient with Hæmophilia and Fracture of Femur.

M. B. COVENTRY *et al.*: *J. Bone & Joint Surg.*, 41-A: 1392, 1959.

With the availability of increasingly precise laboratory assays of more and more coagulation factors, the hæmophiliac patient can now withstand considerable trauma and even extensive surgical procedures. The management of the case of an eight-year-old boy who was a known hæmophiliac is here described. Because of the danger of aggravating the hæmorrhagic tendency manipulation was not carried out, even though position and alignment might not have been accepted otherwise. A Thomas splint with skin traction and a snug elastic bandage proved adequate along with local application of ice.

It is now recognized that three definite types of hæmophiliacs can be differentiated by coagulation tests on the distinctive qualities of (a) the antihæmophilic globulin; (b) the plasma thromboplastin component (or Christmas factor); and (c) the plasma thromboplastin antecedent. As an alternative, cross-checking with blood from patients known to have each of these three defects may be carried out. This information is important in deciding the specific therapy.

In the case cited, both the coagulation time of whole blood and the plasma clotting time were prolonged but, as the prothrombin time was consistently normal, the evidence was strongly suggestive of a defect in the first step of clotting. This entails platelet phospholipid plus antihæmophilic globulin plus plasma thromboplastin component plus plasma thromboplastin antecedent yielding plasma thromboplastin. If the defect were to occur at any subsequent stage of clotting, such as cothromboplastic activation of the plasma thromboplastin, conversion of prothrombin to thrombin, or the thrombic conversion of fibrinogen to fibrin, the prothrombin time would have been affected. As the platelets were normal quantitatively, it was inferred that this child suffered from one of the three hæmophilias.

The authors show not only how the diagnosis of the antihæmophilic globulin type of hæmophilia was made in this patient, but also the quantitative usefulness of the prothrombin consumption test in assessing its severity. Reference is also made to the employment of the thromboplastin-generation test as the newest and most accurate method for identification of classic hæmophilia of the anti-hæmophilic globulin-deficiency type.

It is pointed out that treatment of classic hæmophilia depends on three principles: (a) the concentration of the hæmophilic globulin in plasma of the severe hæmophiliac is less than 1% of normal; (b) anti-hæmophilic globulin is so labile that it survives less than 24 hours in the circulating blood of the hæmophiliac patient; and (c) even with the most careful blood-bank collecting techniques, anti-hæmophilic globulin disappears fairly rapidly from citrated bank blood.

Assuming that the boy referred to had a plasma volume of 1200 ml., a transfusion of one pint of blood, i.e. approximately 250 ml. of plasma, would raise his anti-hæmophilic globulin only about 20% of normal. As experience would suggest that the hæmorrhagic tendency can be checked with the titre between 5 and 10% of normal, frequent small transfusions are administered as indicated.

ALLAN M. DAVIDSON

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BOOK REVIEWS

MEDICAL SURVEYS AND CLINICAL TRIALS. Some Methods and Applications of Group Research in Medicine. Edited by L. J. Witts. 325 pp. Illust. Oxford University Press, London, New York and Toronto, 1959. $5.25.

The study of disease in groups of the community is a comparatively new branch of medical research with infinite possibilities. In this excellent guide to the technique of medical surveys and clinical trials on groups of persons, it is pointed out that Great Britain is particularly favourably placed for such studies, in view of the wide coverage of the population by the National Health Service and the resultant recording of illness. In commenting on the particular value of this type of research, Witts says, "The great virtue of clinical research is that it draws its inspiration from direct contact with sick people. One of the main functions of group research is to broaden this contact and ensure that the clinical scientist's mind remains open to the major problems of human disease."

The book falls roughly into two sections, a first section on methods and techniques, and a second section in which the applications of these techniques to various branches of medicine are discussed. As an instance of the need for more general instruction in the principles of group research, Fletcher and Oldham draw attention to the fact that, in a leading British medical journal, out of 24 investigations involving group research only 12 contained adequate diagnostic criteria; seven of the others had definitions which were not precise and in five no attempt had been made to define the conditions with which the research was concerned.

There is a very valuable chapter on observer error and variation, which also contains a unique bibliography on the subject. The authors point out that group research is more sensitive to observer variation than are individual studies, and show ways in which error may be minimized. There is a chapter on prevalence surveys, which serve the very useful purpose of correcting misapprehensions arising from hospital practice about the natural history of disease. All kinds of trials are dealt with, including retrospective and prospective studies, follow-up studies, the use of volunteers, controls and placebos, and prophylactic and therapeutic trials.

In the second part of the book excellent examples have been chosen of the applications of these methods in such fields as genetics, nutrition, child development, chest diseases, cardiovascular diseases, joint diseases, mental illness, cancer and tropical diseases. The book is full of fundamental but often overlooked information, as for example when the futility of an 80% follow-up of a series of patients is described, with the use of figures. The way in which research of this nature can dispel medical myths is shown by the discussion of typhoid vaccine, whose efficacy was not really demonstrated for some decades until recent trials in Yugoslavia.

It seems to this reviewer that a copy of this book ought to be in the hands of every worker in clinical research; it is almost certain that he will find information in there which he has not been able to acquire elsewhere.

PATHOLOGY OF THE HEART. Edited by S. E. Gould. 1138 pp. Illust. 2nd ed. Charles C Thomas, Springfield, Illinois; The Ryerson Press, Toronto, 1960. $35.75.

Traditionally the reviews of second editions "may call for only short notices", but when the book is of unusual quality and importance one may be pardoned for craving the editor's indulgence in respect of space.

The first edition of Gould's book was published in 1953 and was the most comprehensive text on this subject in English at that time. No attempt has been made since then to rival it, which heightens the interest with which the second edition has been awaited. A first venture of this kind is certain to have defects (at least in the opinions of some readers) and the original volume was no exception; however, the defects were largely those of omission, notably of the acquired lesions of the great vessels. To a satisfactory extent these have been corrected by additions and revisions which, with the use of smaller type, have increased the text by only 100 pages.

The introductory chapters include one on the history of cardiac pathology, and one each on the embryological development and anatomy of the heart. Slight changes have been made in the text and some illustrations have been added. The care with which the text has been revised is exemplified by the change in viewpoint as to the function of the intercalated discs. These are now regarded as demarcating cell boundaries, replacing the long-held belief that cardiac muscle is a syncytium.

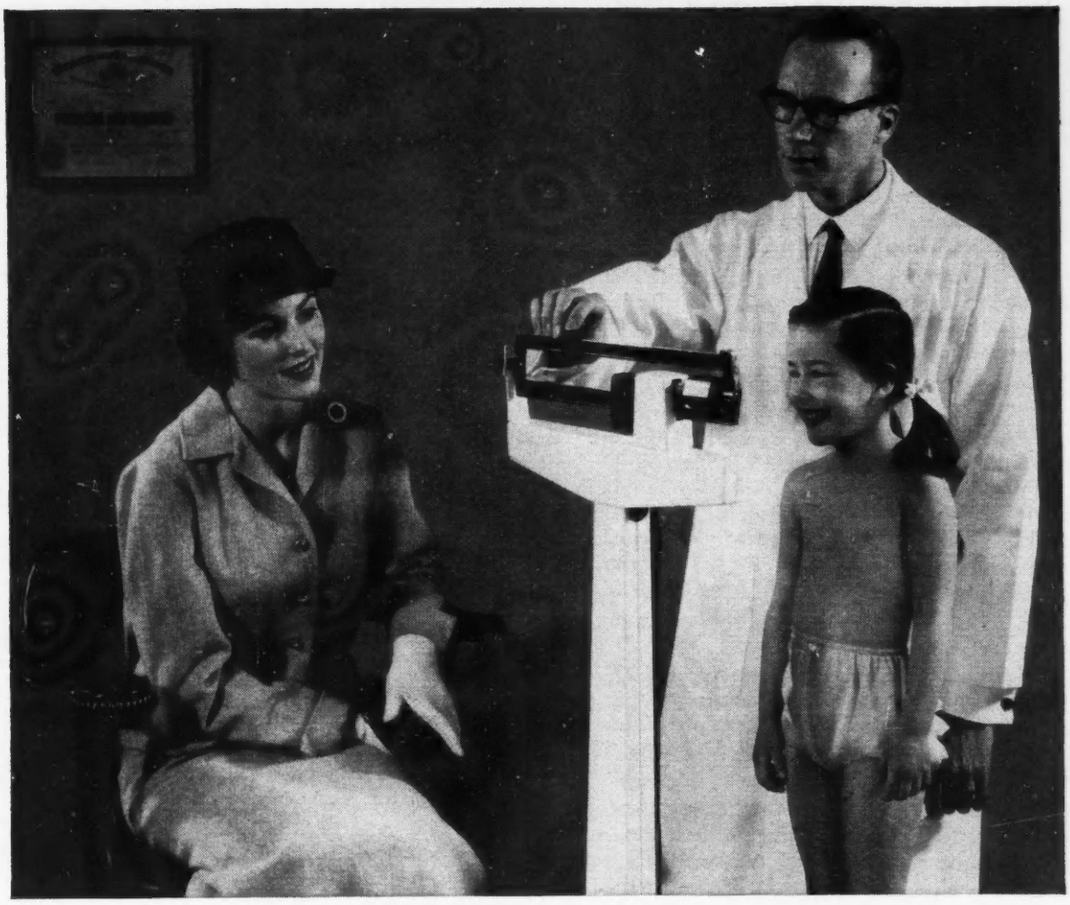
A new feature is a chapter by Lev on the conduction system. Increasing interest in its histology and attempts to correlate the changes with electrocardiographic findings make a more detailed knowledge mandatory even for the clinician. The chapter on physiology has been enlarged 50% with the addition of material on the spread of the electrical impulse. Data on cardiac pressures and output have been revised and brought up to date. Abnormal cardiac function in arrhythmias, valve defects, muscle damage and heart failure is considered but in view of the vastness of these subjects treatment is of necessity brief. Perhaps these topics do not belong in a volume on pathology.

The large section on congenital malformations is a small textbook in itself and a masterly presentation. Diseases of the coronary vessels come in for a full discussion. The very satisfactory chapter on rheumatic disease has been little altered. Non-rheumatic, parasitic, traumatic and neoplastic diseases of the heart receive adequate attention. Two new chapters, on lesions of the aorta and on cardiopulmonary disease, fill commendably the gaps noted in the first edition. A necessarily sketchy account of cardiac surgery is another new feature. Again one is dubious about its place in a book of this sort.

For the pathologist, as in the first edition, there is a section on the technique of gross examination and on the injection of the coronaries. A summary of histochemical methods has been added.

Throughout, the illustrations are numerous, pertinent and of first-rate quality. Key references are appended to each section. The first edition was a monumental achievement but the second is even more impressive. The pathologist may find some of the discussions lacking the finest details, but for the internist, cardiologist and postgraduate student the treatment is full and comprehensive. This volume can be recommended without reservation.

(Continued on page 950)



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*Brown, S. S.; Libo, H. W., and Nussbaum, A. H.: Norethandrolone in the Successful Management of Anorexia and "Weight Lag" in Children, Scientific Exhibit presented at the Annual Meeting of the American Academy of Pediatrics, Chicago, Oct. 20-23, 1958.

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(Continued from page 948)

A MANUAL FOR HISTOLOGIC TECHNICIANS. Ann Preece, Chief Technologist, Pathology Laboratory, Massachusetts Memorial Hospital. 219 pp. Illust. Little, Brown and Company, Boston and Toronto; J. B. Lippincott Company, Montreal, 1959. $6.00.

This is an excellent manual. At first glance, it appears to be a short, elementary introduction to histopathological techniques, and in the preface the author states that it is not a reference book, but is intended primarily for the trainee technician. However, the manual includes easy-to-understand descriptions of all the standard preparative and staining techniques and of some other techniques which are not so commonly employed in a routine pathology laboratory.

This reviewer feels sure that this manual will be used in many routine and research laboratories as a standard reference text. The description of each staining method includes a reference which is the ideal situation for it in a book of this nature, and there are 26 blank pages at the end of the book for notes, which is a most thoughtful arrangement. There is a short chapter on histology which is not up to the excellent standard of the remainder of the text and which should be either improved, particularly with regard to the small line drawings, or omitted in future editions. The index is excellent.

MAZER AND ISRAEL'S DIAGNOSIS AND TREATMENT OF MENSTRUAL DISORDERS AND STERILITY. S. Leon Israel, University of Pennsylvania. 666 pp. Illust. 4th ed. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, 1959. $15.00.

The fourth edition of this book, almost entirely rewritten by Dr. Israel, is highly recommended to those gynæcologists especially interested in disorders of menstruation and sterility. Throughout the book the author has attempted to bring to the reader an excellent review of current thought on the subject under discussion. The bibliography at the end of each chapter is very worth while.

Gynæcologists, in general, would be well advised to peruse the chapters dealing with basic concepts of menstruation. The clinical aspects are generally sound, despite the fact that individuals might differ in their approach to certain problems.

The rather "elegant" style of writing and unusual vocabulary might be disturbing to some, but to this reviewer they offered a pleasant and stimulating change in medical writing.

A GUIDE TO ANTIBIOTIC THERAPY. Henry Welch. 69 pp. Medical Encyclopedia, Inc., New York, 1959.

This is an ingenious compendium of information in an extremely compact form regarding all the available antibiotics. In a compass of 70 pages, 28 antibiotics are described in terms of their general application, side effects, dosage, and forms available for use. In addition, the specific antimicrobial activity of each against a panel of 60 micro-organisms is set forth in semi-diagrammatic form. A useful list of generic and trade names is included, with mention of a few that are being developed in other countries and may become available here. The problem in this field is exemplified by the fact that two new and apparently significant modifications of older antibiotics have appeared since the book was issued, less than a year ago. However, it is a very convenient and useful reference book.

CATE'S PRIMARY ANATOMY. J. V. Basmajian, Professor and Head of the Department of Anatomy, Queen's University, Kingston, Ontario. 360 pp. Illust. 4th ed. The Williams & Wilkins Company, Baltimore, Maryland, 1960. $6.50.

The original aim of this book was to provide a single text which could be used with varying emphasis to provide anatomical instruction to a wide variety of non-medical students. Despite the difficulties inherent in planning such a "universal" text, it was eminently successful. The present edition is primarily distinguished by extensive changes in the illustrations, which now number more than 500 original figures. These are strikingly successful. The only criticism now applies to the handful of borrowed illustrations, some of which, by contrast, look very poor indeed. In its present form the book not only should retain its popularity in the teaching of the non-medical students but will probably recruit medical-student adherents as well who will find its concise approach a useful adjunct to their other texts.

ANATOMIES OF PAIN. K. D. Keele, Ashford Hospital, England. 206 pp. Illust. Charles C Thomas, Springfield, Illinois; The Ryerson Press, Toronto, 1957. $6.50.

A scholarly review is presented of the history of the trend of thought concerning sensation, emotion and pain from ancient Egyptian times to the present.

The reviewer found Chapter 2—"The Greek debate on the heart, brain and pain"—and Chapter 3—"The central nervous system emerges as the basis of sensation"—particularly interesting.

The latter part of the book reviews contemporary knowledge of the physiology of sensation, and of pain mechanisms, and a fair amount of general neurophysiology.

Each chapter has numerous references, the whole comprising a valuable bibliography. There are 27 well-chosen illustrations.

The book is an admirable short history concerning pain, save that psychogenic regional pain receives scant consideration.

CHEMICAL QUANTITATION OF EPINEPHRINE AND NOREPINEPHRINE IN PLASMA. Their Plasma Concentration in Hypertension, Shock and Mental Disease, with Some Metabolic Studies. W. Muir Manger, Khalil G. Wakim and Jesse L. Bollman. 398 pp. Illust. Charles C Thomas, Springfield, Ill.: The Ryerson Press, Toronto, 1959. $12.75.

The title of this book describes the content of the first chapter. The remaining five chapters are devoted to a review of experimental and clinical studies carried out by the authors and by other workers in the same field.

The descriptions of the authors' methods are given clearly and in detail, a feature of interest and value to those making, or considering the use of, such estimations. The practical value of measuring epinephrine and norepinephrine for the diagnosis of phæochromocytomas, and the theoretical implications of these estimations in shock, in hypertension and in mental diseases, are discussed.

A good deal of the work reported originated in the Mayo Clinic and Foundation, the institutions to which the authors belong. In addition, extensive references to pertinent work elsewhere make the book of value to all those interested in the effects and metabolism of the catecholamines.

The approach and descriptive writing are simple, easy to follow and within the purview of any physician.

BASIC PHYSICS IN RADIOLOGY. L. A. W. Kemp and R. Oliver. 329 pp. Illust. Charles C Thomas, Springfield, Illinois; The Ryerson Press, Toronto, 1959. $10.25.

This book is intended to serve as an elementary physics textbook for radiological students, particularly in the United Kingdom. The authors are experienced hospital physicists, practised in the teaching of radiological physics. The range of subject matter covered in the book is essentially that found in any elementary physics textbook, but the presentation is mainly descriptive and the use of mathematics has been avoided as much as possible. In addition, the examples and exercises are drawn from radiology, and serve to illustrate the physical principles underlying some aspects of the design and construction of x-ray generators.

The book is thoughtfully written, and many concepts often found to be difficult for students to grasp are covered with a commendable clarity and conciseness.

It is perhaps unfortunate that the authors, who are specialists in the subject, chose not to include any radiation physics. The book's usefulness would probably have been increased if a brief presentation of the basic principles of radiation physics had been made in the same lucid and economical style used throughout the book.

OFFICE ORTHOPEDICS. Lewis Cozens, Los Angeles, Calif. 430 pp. Illust. 3rd ed. Lea & Febiger, Philadelphia; The Macmillan Company of Canada Limited, Toronto, 1959. $9.50.

This third edition of a book which has been known for the concise information which it gives, will bring the general surgeon and the general practitioner up to date on changes in the practice of office orthopædics. Much of the material has been completely revised, and the illustrations of the methods used and the splints applied are clear and uncomplicated.

In the first section a general outline is given covering the materials necessary to deal with minor orthopædic problems in the office. This is followed by a practical discussion of the types of physical therapy in general use and their application, followed by a brief chapter on local anæsthesia.

In the second section the extremities and the vertebral column are discussed from the point of view of the pathological changes which occur and which may be treated successfully in an ambulatory fashion.

The final section contains a series of chapters devoted to symptomatology—limp in a child, painful arm or leg in an adult, weakness of arm or leg in an adult, etc.—and in these a brief but comprehensive outline of the differential diagnosis is submitted with an extensive and up-to-date bibliography at the end of each chapter for further study.

This book will make a welcome addition to the library of any general surgeon or general practitioner who is interested in treating minor orthopædic problems.

ANTITHROMBOTIC THERAPY. Paul W. Boyles, Director of the Coagulation Research Laboratory, Miami Heart Institute, Miami Beach, Florida, U.S.A. 131 pp. Illust. Grune & Stratton, Inc., New York and London, 1959. $5.00.

To everyone dealing with cardiovascular disease, the problem of thrombosis, its prevention and treatment, is paramount. As the author says in his preface: "This monograph has been prepared to provide the clinician with a practical understanding of the normal mechanisms of blood coagulation and coagulation defects produced by antithrombotic therapy."

Each of the chapters is brief, too brief for any intensive discussion and too brief for any but dogmatic statements in a very controversial field. The mechanism of coagulation, clotting tests, anticoagulants and their usage in short-term and long-term therapy, and clot-dissolving enzymes are discussed. In the addendum the various coagulation-test techniques are outlined. A very useful table of synonyms for the various factors is appended.

In general, the author appears to favour the use of anticoagulants in pulmonary embolism, cardiac infarction and peripheral embolism but to be cautious about their use in cerebral vascular disease. Apparently favourable mortality figures on long-term anticoagulant therapy after cardiac infarction are reported from a number of sources, but the author admits that such results are as yet not conclusive. Thrombolytic therapy, particularly with fibrinolysin, appears promising but so far no convincing results have been obtained with currently available preparations.

This monograph is convenient for quick reference but is not intended to be comprehensive.

PRAKTISCHE ANATOMIE (Practical Anatomy: The Arm). T. von Lanz and W. Wachsmuth. 308 pp. Illust. 2nd ed. Springer Verlag, Berlin, Göttingen and Heidelberg, Germany, 1959. DM. 168.-

It is now 30 years since von Lanz, an anatomist, and Wachsmuth, a surgeon, began their monumental work of reviewing the vast body of anatomical knowledge from the standpoint of practical medicine. The authors called their enterprise "Practical Anatomy" and intended it to provide a secure anatomical basis for all forms of medical intervention. Three volumes have so far appeared, "The Arm" (1935), "The Leg" (1938) and "The Neck" (1955). Even before the completion of this remarkable undertaking a second edition of the volume on the arm has become necessary, since the whole of the type set up and the blocks of the illustrations had been destroyed during the war. This has provided an opportunity for corrections and some additions. The illustrations, numbering over 200 and mostly colour, are exceptionally clear and seem to give the page a third dimension. They are likely to please and inform even those who lack a reading knowledge of scientific German. The text provides a panorama of anatomical, biological and clinical information about the arm. A general section (52 pages with nearly as many illustrations) deals with, among other matters, the principles of the structure of the upper extremity, its development, its blood vessels and nerves and the method of its clinical investigation. Particularly helpful are the schematic drawings of the territories served by each of the brachial nerves. The special section is divided into chapters on the shoulder, the upper arm, the elbow region, the lower arm, the hand and fingers.

With few exceptions the terminology employed is the Paris one (PNA 1955) but the index also still includes the usual terms sanctioned by the conventions of Basel (BNA 1895) and Jena (JNA 1935). The list of references, 15 pages strong, is almost entirely composed of citations of German publications. The grandiose style of this treatise has also affected its typography. The excessively wide layout, with its long unbroken lines of print, will probably prove trying to the eyes of some readers. This remarkable volume ought to be available for study and enjoyment in all medical libraries.

CHILDBIRTH WITHOUT PAIN. Pierre Vellay and others; translated from the French by Denise Lloyd. 216 pp. Illust. George Allen & Unwin Ltd., London, 1959. $4.75 approx.

It is difficult to imagine that the agonies of childbirth exceed the distress of this reviewer in attempting to read this book.

Obstetricians of today, in general, accept the principle that the informed, reassured patient performs better in labour. Vellay and his group appear to accomplish admirably these two important facets of obstetrical practice. The illustrations of patients being delivered, presumably in Dr. Vellay's clinic, point to the fact that asepsis and antisepsis are not part of their obstetrical armamentarium. The average doctor practising obstetrics in this country could not accept the mediæval approach to antisepsis demonstrated in these pictures.

The book suffers too, in the reviewer's view, from many pseudo-scientific descriptions and, in several instances, from erroneous physiological concepts. Persons who preach natural childbirth have yet to support with sound scientific evidence their dogma that nature is the best obstetrician.

The book is written for the impressionable lay public. It should not be considered a modern scientific text.

FORTHCOMING MEETINGS

CANADA

QUEBEC DIVISION, Canadian Medical Association, 22nd Annual Meeting, Quebec City. (Dr. D. G. Kinnear, Honorary Secretary, 2115 Drummond Street, Montreal 25, Que.) May 5-7, 1960.

DIVISION DU QUÉBEC, Association Médicale Canadienne. Le 22e congrès annuel sera tenu dans la ville de Québec. (Dr D. G. Kinnear, secrétaire honoraire, 2115 rue Drummond, Montréal 25e.) 5-7 mai 1960.

ONTARIO MEDICAL ASSOCIATION, 80th Annual Meeting, Toronto, Ont. (Dr. Glenn Sawyer, General Secretary, 244 St. George Street, Toronto 5, Ont.) May 9-13, 1960.

CANADIAN ACADEMY OF ALLERGY, Annual Meeting, Victoria Hospital, London, Ont. (Dr. John H. Toogood, Secretary, 450 Central Ave., London, Ont.) May 14, 1960.

CANADIAN PUBLIC HEALTH ASSOCIATION, 48th Annual Meeting, Halifax, N.S. (Dr. G. W. O. Moss, Honorary Secretary, 150 College Street, Toronto 5, Ont.) May 31-June 2, 1960.

CANADIAN FEDERATION OF BIOLOGICAL SOCIETIES (comprising the Canadian Physiological Society, the Pharmacological Society of Canada, the Canadian Association of Anatomists and the Canadian Biochemical Society), Third Annual Meeting, Winnipeg, Man. (Dr. E. H. Bensley, Honorary Secretary, Montreal General Hospital, 1650 Cedar Ave., Montreal 25, Que.) June 8-10, 1960.

THE SOCIETY OF OBSTETRICIANS AND GYNÆCOLOGISTS OF CANADA, Annual Meeting, Jasper Park Lodge, Jasper, Alta. (Dr. F. P. McInnis, Secretary, 280 Bloor St. West, Toronto 5, Ont.) June 9-12, 1960.

CANADIAN OTOLARYNGOLOGICAL SOCIETY (SOCIÉTÉ CANADIENNE D'OTOLARYNGOLOGIE), Annual Meeting, Jasper Park Lodge, Jasper National Park, Alberta. (Dr. Donald M. MacRae, Secretary, 324 Spring Garden Road, Halifax, N.S.) June 10-12, 1960.

CANADIAN OPHTHALMOLOGICAL SOCIETY (SOCIÉTÉ CANADIENNE D'OPHTALMOLOGIE), Annual Meeting, Jasper Park Lodge, Jasper National Park, Alberta. (Dr. R. G. C. Kelly, Secretary, 90 St. Clair Avenue West, Toronto 7, Ont.) June 13-15, 1960.

CANADIAN MEDICAL ASSOCIATION, 93rd Annual Meeting, Banff, Alberta. (Dr. A. D. Kelly, General Secretary, C.M.A. House, 150 St. George Street, Toronto 5, Ont.) June 13-17, 1960.

CANADIAN DIETETIC ASSOCIATION, 25th National Congress, Montreal, Que. (Miss Claire Dalmé, M.N.S., Chairman, Publicity Committee, Institute of Dietetics and Nutrition, University of Montreal, P.O. Box 6128, Montreal, Que.) June 14-16, 1960.

CANADIAN SOCIETY OF INTERNAL MEDICINE, Annual Business Meeting, Banff Springs Hotel, Banff, Alta. (Dr. Victor O. Hertzman, Secretary, 1744 West Broadway, Vancouver 9, B.C.) June 17, 1960.

CANADIAN TUBERCULOSIS ASSOCIATION, 60th Annual Meeting, Ottawa, Ont. (Dr. G. J. Wherrett, Executive Secretary, 265 Elgin St., Ottawa, Ont.) June 27-30, 1960.

CANADIAN UROLOGICAL ASSOCIATION, Annual Meeting, Banff Springs Hotel, Banff, Alta. (Dr. David Swartz, President, 332-404 Graham Ave., Winnipeg 1, Man.) July 1-3, 1960.

PACIFIC DERMATOLOGIC ASSOCIATION, Annual Meeting, Victoria, B.C. (Dr. Edward J. Ringrose, Secretary-Treasurer, 2636 Telegraph Ave., Berkeley 4, Cal., U.S.A.,) September 1-4, 1960.

2ND WORLD CONGRESS OF THE WORLD FEDERATION OF SOCIETIES OF ANÆSTHESIOLOGISTS, Toronto, Ont. (Dr. R. A. Gordon, Chairman of Organizing Committee, 178 St. George Street, Toronto 5, Ont.) September 4-10, 1960.

ONTARIO PUBLIC HEALTH ASSOCIATION, Annual Meeting, Toronto, Ont. (Dr. G. K. Martin, Secretary-Treasurer, O.P.H.A., Room 405, 67 College St., Toronto, Ont.) October 3-5, 1960.

CANADIAN HEART ASSOCIATION AND NATIONAL HEART FOUNDATION OF CANADA, Joint Annual Meeting, Toronto, Ont. (For information write: Dr. John B. Armstrong, National Heart Foundation, 501 Yonge St., Toronto 5, Ont.) November 30 to December 3, 1960.

UNITED STATES

AEROSPACE MEDICAL ASSOCIATION, Thirty-First Annual Meeting, Bal Harbour, Miami Beach, Florida. (Aerospace Medical Association, Washington National Airport, Washington 1, D.C.) May 9-11, 1960.

INTERNATIONAL SOCIETY FOR TROPICAL DERMATOLOGY, Inaugural Meeting, New York, N.Y. (Dr. Frederick Reiss, Organizing General Secretary, 870 Fifth Avenue, New York 21, N.Y.) May 10, 1960 (8 p.m.).

NATIONAL TUBERCULOSIS ASSOCIATION, Annual Meeting, in conjunction with the American Trudeau Society, Los Angeles, Calif. (Sol S. Lifson, Director, Education and Public Relations, National Tuberculosis Association, 1790 Broadway, New York 19, N.Y.) May 16-18, 1960.

INTER-SOCIETY CYTOLOGY COUNCIL, Annual Scientific Meeting, Chicago, Ill. (Dr. Paul A. Younge, Secretary-Treasurer, 1101 Beacon St., Brookline 46, Mass.) September 23-25, 1960.

AMERICAN COLLEGE OF SURGEONS, 46th Annual Clinical Congress, San Francisco, Cal. (Dr. William E. Adams, Secretary, American College of Surgeons, 40 East Erie St., Chicago 11, Ill.) October 10-14, 1960.

OTHER COUNTRIES

Second Asian-Pacific Congress of Cardiology, Melbourne, Australia. (Dr. A. E. Doyle, Secretary, Alfred Hospital, Melbourne, S.1, Victoria, Australia.) Week of May 23, 1960.

INTERNATIONAL WAR-PROPHYLAXIS CONGRESS FOR PHYSICIANS, Noordwijk, Holland. (Prof. M. Knap, 46 Schuberstraat, Amsterdam, Holland.) May 23-28, 1960.

6TH INTERNATIONAL CONGRESS OF INTERNAL MEDICINE (organized by the International Society of Internal Medicine), Basle, Switzerland. (Executive Committee, Steinentorstrasse 13, Basle, Switzerland.) August 24-27, 1960.

VIII INTERNATIONAL CONGRESS OF HÆMATOLOGY, Tokyo, Japan. (Organizing Committee, Science Council of Japan, Ueno Park, Taito-ku, Tokyo, Japan.) September 4-10, 1960.

MEDICAL NEWS *in brief*

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CANADIAN ACADEMY OF ALLERGY

The 24th Annual Meeting of the Canadian Academy of Allergy will be held in London, Ontario, on Saturday, May 14, in the Busby Memorial Lecture Room, Victoria Hospital. The guest speaker in the morning will be Professor Carl E. Arbesman, University of Buffalo, who will speak on serological studies in serum sickness. The following papers will also be given: "Allergy in childhood"—Dr. Norman Epstein, Toronto; "A quantitative comparative assay of anti-whealing drugs in man"—Dr. John H. Toogood, London; "Steroid aerosols in bronchial asthma"—Dr. Jacques Léger, Montreal; "Further observations on the response of the adrenal to corticotrophin in patients on long-term steroid therapy"—Dr. Bram Rose, Montreal.

The President, Dr. C. H. A. Walton, Winnipeg, will give his address in the afternoon, to be followed by papers on "Pitfalls in pædiatric allergy" by Dr. John Vincent, London, and "Coffee bean allergy – an occupational disease" by Dr. S. O. Freedman, Montreal. The second guest speaker will be Professor John M. Sheldon, University of Michigan, whose paper will be "Some considerations in the use of repository pollen therapy". The annual business meeting of the Academy will follow, with dinner at the Hotel London.

—

TREATMENT OF MALIGNANT PLEURAL EFFUSIONS BY TALC POUDRAGE

The treatment of persistent pleural effusion due to incurable cancer is a difficult problem. In 1935, Bethune first reported the use of talc poudrage as a preliminary procedure to lobectomy, and now Haupt *et al.* have reported excellent results from the use of talc poudrage in the treatment of 19 patients with pleural effusion secondary to irremovable cancer (*J. A. M. A.*, 172: 918, 1960). The procedure was well tolerated and attended with no significant morbidity.

An infra-axillary incision is used, which permits exploration of the affected hemithorax, and can be extended if the lesion is found to be resectable. If it is not resectable, the pleural surfaces are generously dusted with sterile talc and two fenestrated intercostal drainage tubes are inserted through separate stab wounds. The latter permit application of suction to maintain complete obliteration of the pleural space for 48 to 72 hours.

In this series, the relief of dyspnœa, prevention of recurrent accumulations of fluid and palliation afforded were striking. The average hospital stay was 10 days. All patients were relieved of their preoperative dyspnœa.

—

PINWORM INFESTATION

Pinworm infestation faces every G.P. and pædiatrician frequently, in all its obstinacy. There are those however who feel that its importance as a form of infestation should not be over-estimated. Dr. J. R. Paul, Jr., professor of pædiatrics

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MEDICAL NEWS *in brief*

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at the Medical College of South Carolina, writes in the March 4, 1960 issue of the *Medical Letter*, "I have seen a good many families who have spent literally years trying to rid themselves of enterobiasis, and have become rather severely disturbed emotionally about these completely harmless creatures. I do not believe that it is necessary to do pinworm swabs on children who do not have symptoms, as I am convinced that pinworms are occasional if not long-term virtually saprophytic inhabitants of the rectum of up to 100% of school children. I think there is much less evidence that pinworms have anything to do with producing disease than there is against the common house fly." This is not to say, however, that if reinfestation is to be thought of, reasonable measures should not be carried out. It is desirable that hands be washed before meals and cotton undergarments changed twice a day; also that bedroom and bathroom floors be washed at the end of the treatment course.

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MAGNESIUM-DEFICIENCY TETANY

A new specific clinical entity, human magnesium-deficiency tetany, which is virtually identical with that of hypocalcæmic tetany from which it can be differentiated only by chemical means, has been described by Vallee, Wacker and Ulmer of Boston in the *New England Journal of Medicine* (262: 155, 1960). The disease has been observed in five patients and its clinical manifestations corresponded almost exactly to those seen in magnesium-deficient animals. The symptoms and signs responded promptly and completely to the parenteral administration of magnesium sulfate. The five patients, three men and two women, were between 38 and 60 years old and suffered from severe malnutrition, secondary to intestinal malabsorption or chronic alcoholism. Their tetany was manifested by either spontaneous carpopedal spasm or positive Chvostek or Trousseau sign. Generalized seizures were also seen in three of them. No correlation could be established between their state of consciousness and the concentration of magnesium in the serum; their mental status varied from complete lucidity to semi-coma at the time tetany was present. Although the level of serum magnesium was considerably depressed during tetany, the level of serum calcium was normal. No serious disturbance in concentration of phosphorus, chloride, carbon dioxide or total serum protein was detected.

The possible relation between tetany and the ratio of ionized and protein-bound serum magnesium has not yet been investigated. Among the various causes which may bring about tetany from deficiency in magnesium, simple dietary restriction must be ruled out as it does not produce this syndrome, nor does prolonged debilitation even though it brings about a negative magnesium balance and depletes the body stores of this element. Although malnutrition was a factor in all five patients, tetany did not develop on this basis alone. The presence of some factor which either prevented the absorption or increased the excretion of magnesium was required to bring the syndrome into the open.

Low serum concentrations of magnesium or calcium will lower the threshold of motor nerves to stimulation; in this respect their actions are similar. As regards muscle their actions differ: low levels of magnesium will enhance muscle contraction and low calcium levels will inhibit it.

—

SUCCESSFUL REMOVAL OF BRAIN TUMOUR AFTER CARDIAC ARREST

A report is presented from the Mayo Clinic by Uihlein, Lippert and Welch (*Proc. Staff Meet. Mayo Clin.*, 35: 82, 1960) of the successful removal of a tumour of the brain in spite of cardiac arrest. In addition to this, hypothermia was used to carry on the operation after the cardiac arrest had been treated successfully. The authors point out the requirements which should be met in the treatment of cardiac arrest. These are: (1) establish the diagnosis; (2) open the chest through the fourth or fifth left interspace whilst the anæsthesiologist oxygenates the patient and intubates the trachea; (3) begin artificial circulatory action by rhythmic compression of

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the heart either extra- or intrapericardially; (4) restore cardiac action by the use of intracardiac drugs such as epinephrine, calcium gluconate, procaine hydrochloride or potassium together with the use of the electric defibrillator; (5) close the chest after lavage and the intrapleural use of antibiotic agents. They go on to point out that after the restoration of effective cardiac action, even urgent surgical treatment can be performed as was done in this case. Where hypothermia is available, they feel that it can be used in continuing the operative work in such cases.

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DETROIT POLIOMYELITIS EPIDEMIC OF 1958

During an epidemic of poliomyelitis in Michigan in 1958, virological and serological studies were carried out with specimens from 1060 patients. Brown, Lenz and Agate (*J. A. M. A.*, 172: 807, 1960) report that fæcal specimens from 869 patients yielded no virus in 401 cases, poliovirus in 292, ECHO (enteric cytopathogenic human orphan) virus in 100, Coxsackie virus in 73, and unidentified virus in three cases. Sera from 191 patients from whom no fæcal specimens were obtainable showed no antibody changes in 123 cases but did show changes diagnostic of poliovirus in 48, ECHO viruses in 14, and Coxsackie virus in six.

Most of the virus-confirmed cases of poliomyelitis (paralytic and non-paralytic) occurred in persons who had received no poliomyelitis vaccine. The number of poliovirus-confirmed paralytic cases decreased among persons who had received one or more doses of vaccine, as was borne out by the fact that only 11 of 218 such cases were found to have been vaccinated three or more times.

In a large number of paralytic as well as non-paralytic patients, poliovirus was not the cause. Frequency studies showed that there were no obvious clinical differences among infections with Coxsackie, ECHO, and poliomyelitis viruses. Coxsackie and ECHO viruses were responsible for more cases of "non-paralytic poliomyelitis" and "aseptic meningitis" than was poliovirus itself. In particular, the Coxsackie B5 and ECHO 9 viruses were found to be the most prevalent.

—

UNEXPECTED BASAL CELL CARCINOMA

Basal cell cancer, although rare in the teens and unusual in the twenties, should nevertheless not be overlooked as a possibility in differential diagnosis of skin lesions in young patients. In a group of 17 such cases, diagnosis of the lesion was not established for an average of 6.1 years after the onset of the lesion. In a series of 41 cases presented by Murray and Cannon in the *New England Journal of Medicine* (262: 440, 1960) the diagnosis was overlooked in 11 patients with characteristic lesions because the likelihood of the disease seemed remote. In some instances a presumably benign condition had existed before and underwent malignant change without any trauma. In other cases a single accidental trauma or multiple trauma apparently activated the disease. Location of the lesion in this age group is similar to that found in older patients.

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MEDICAL NEWS *in brief*

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ONTARIO DEATH STATISTICS

The Division of Medical Statistics of the Ontario Department of Health has recently published their annual report for 1958. In their list of the chief causes of death in Ontario from 1953 to 1957, the order is not very different from previous recent periods or for other parts of Canada, but a review of the causes is of interest. Immaturity, postnatal asphyxia and atelectasis, and injury at birth were the three major causes of death noted among infants under one day of age and also for the group one to six days. In the pre-school years, ages one to four, accidents accounted for 35% of the total recorded deaths. Pneumonia, bronchitis, and influenza were in second position.

For school ages, five to 14 years, accidents remained the most important cause, with cancer in second position contributing 11.6%. Acute poliomyelitis ranked sixth, accounting for 1.6% of the total. In the adolescent age period, 15-19 years, the same ranking of causes of death continued, with the exception that suicide and self-inflicted injury entered into fifth position, contributing between 40 and 50 deaths in Ontario. By 35 years, the ranking of causes was accidental causes first, cancer second, diseases of the heart third, and suicide fourth. Tuberculosis was in eighth place. From 35 years on, diseases of the heart occupied first position and cancer second.

CANADIAN CANCER RESEARCH CONFERENCE

The Fourth Canadian Cancer Research Conference will be held at Honey Harbour, Ontario, from June 12 to 16, 1960. Sponsored by the National Cancer Institute of Canada, this conference is primarily designed as a review of present knowledge on various aspects of cancer for the benefit of Grantees and Fellows of the Institute. The topics to be discussed include perspectives in biochemistry in cancer research, cell behaviour, viral carcinogenesis and chemotherapy. Since accommodation is limited, attendance must be by application only. Further information may be obtained from Dr. Robert L. Noble, Collip Research Laboratory, University of Western Ontario, London, Ontario.

SUMMER COURSES IN PROSTHETICS

New York University Post-Graduate Medical School will offer a series of two-week summer courses in prosthetics in co-operation with the International Society for the Welfare of Cripples just prior to the Eighth World Congress. These courses will constitute the Third International Prosthetics Course sponsored by the Committee on Prosthesis, Braces and Technical Aids of the ISWC.

Separate two-week courses for (1) physicians and surgeons, (2) therapists, and (3) prosthetists will be offered each meeting from August 15 to 26, 1960.

Applications and further information concerning these courses may be obtained by writing: Dr. Sidney Fishman, Director, Prosthetics Education, New York University Post-Graduate Medical School, 342 East 26 Street, New York 10, N.Y.